

TO DYE FOR: FROM SEED TO STORAGE  
AN EXAMINATION OF THREE PURPLE GARMENTS

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## Abstract

Dyes, both natural and synthetic were a critical part of textile manufacture in the nineteenth century. Using an interdisciplinary and material culture approach, this thesis uses three extant purple dresses to follow the ingredients used to dye these artifacts in Canada and around the world. The first portion focuses on the global journey the dyes and silk took before becoming the fabric for these garments. The second section focuses on one of the garments, a wedding dress belonging to Clara Bell Waddell, a nineteenth century resident of Hamilton, from its construction to eventual donation to Black Creek Pioneer Village, offering understanding into Canadian social history. Taken together, these three garments provide insight into the fashion history and international and Canadian textile manufacture.

I'd like to dedicate this thesis to my father, Henry Gilbert.

Without his curiosity about the past  
and his unending affinity for STUFF,  
this thesis would have never happened.

And to my friend, Tanit Mendes, for her love of life and colour.

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## INTRODUCTION

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*Purpura* is the Latin name of a particular kind of shellfish which, when ground up, produces a bright purple dye, which in turn was taken from the Greek word *porphura* to describe the same sea creature. The word *purpura* later began to refer to the dye, and eventually the color of this dye. When this dye was exported to England, the word purple was imported into English as well. (Nelson, Onna. *How Ten Colours Got Their Names*, [www.mentalfloss.com](http://www.mentalfloss.com))

Museums are where the past is brought into the present, where today's generation can understand our world and how we got here. Not everything can be displayed at the same time, so hidden in boxes and acid-free tissue paper, are gems waiting to be sought out. There is something delightful about going beyond the displays and getting a look at the "backstage" area of a museum. At first glance, it has a very similar feel to theatre storage spaces. Artifacts are on shelves in categories, some out in the open, others carefully wrapped and boxed. The difference being that, in the museum, these are 'real' things, not reproductions. There is a feeling of awe wandering past the artifacts sitting on the shelves in a museum's holdings. Each object makes one wonder: whom did they belong to, how were they used, and how did they get here. The marvel grows in opening the boxes, some of which have not been touched for decades.

I have worked as a costumer in the Canadian theatre industry for over twenty years and at Ryerson's School of Performance since 2003. Creating stage costumes includes researching how to recreate historical garments. Much of this research is carried out with books and images, but a great deal can be learned from original garments. Another part of my work has included dyeing clothing and fabric. This is where I developed a real appreciation for colour and the meaning it can bring to characters and story telling. In addition to my love of costuming, I have a deep fascination



with science and technology. Specifically how one aspect of technology influences another. So when it came time to take on a new challenge, it felt natural to combine these interests and examine history of fabric dyes, fashion and the world they enveloped.

I had determined early on that material culture methodologies would be the ideal method of research for my thesis in order to understand how colour of the artifacts was obtained. I was looking for items that could work together as a group; that shared a common theme. To find enough pieces for my research, I needed to sift through two different collections: Black Creek Pioneer Village (BCPV) and the Oakville Museum (OM).

I began at Black Creek Pioneer Village going through the long archival boxes; some of which held as many as seven different dresses.<sup>1</sup> The garments were wrapped and occasionally stuffed with acid-free tissue paper to help preserve them, to keep their shape and not allow creases to settle. Taking a garment from the box is akin to moving a patient from their bed and transporting them to another. In order to do as little damage as possible to these delicate artifacts it often takes more than one person, sometimes three to support the garment from the box to the covered table. Over time fabrics become increasingly fragile, as their fibres are very susceptible to light, humidity, dirt, sweat, stains, and insects, making them tricky items to preserve and display.

I examined the garments thoroughly to make sure the colour had not faded or changed. I wanted to make sure they were actually the colour they seemed. Certain colours can change dramatically over time depending on the dyes and the chemicals used, the fibre type, use, and how

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<sup>1</sup> A note about the use of the word 'dress' and nineteenth-century garments. Today when we use the word 'dress' we assume that it is a garment that is one piece with a bodice (top portion covering the torso) and a skirt attached or continuing from the bodice. Some dresses of the nineteenth century were built this way, but many, especially after the 1830s, were worn as two separate pieces. The garments became more complex as the century continued and some skirts had two matching bodices, but the term 'dress' still applied (Barnard 1996, 9).

they were stored. Sometimes an entire garment can vary from its original colour, while others just have portions transformed. Usually in places like a seam that was covered by trim, folded under, or hidden in the seam allowance, one can find places where sunlight and the elements have not reached. Underneath these folds and seams, one can find the original colour.

Another feature I needed to find was the selvage edge. It is the finished edge that runs the length of the fabric. Some selvage edges are woven in another colour from the main body of the fabric. Finding this edge could help determine at what stage the fibres were dyed. Sometimes this edge is cut off, so the fabric can lie smoothly. The garments I examined in the two collections mostly had retained their selvage edges. This speaks a great deal to the labour-saving methods and sewing techniques people employed during the Victorian era. The selvage edge is one less seam that needs to be finished, saving time and materials. Finishing a seam either by hand or machine stops the fabric from fraying and prolongs the life of the garment.

Dyeing can be performed prior to or after the fibres are spun, or after being woven as a length of cloth. Tartan and velvet are good examples of how the fibres need to be dyed prior to the weaving stage.<sup>2</sup> If tartan is dyed after it is woven without the fibres having been pre-treated, none of the patterns of colour will survive, and if velvet is dyed after it is created then the pile is ruined (Diadick Casselman 2008, 16-18).<sup>3</sup>

Many general studies treat wool dyeing and cotton printing as a single entity, yet each fibre requires different dye methods. Equally troublesome is the tendency to locate wool dyeing within finishing techniques where it vanishes amid fulling, napping and shearing. (Diadick Casselman 2008, 16-17)

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<sup>2</sup> There are two ways of describing fabric. One is by fibre type; the other is how it is woven. For instance, velvet refers to a specific fabric that has a pile or nap. It can be made of silk, cotton, rayon, or a combination of fibres, with one fibre for the base and another for the nap. Garment B is it made of silk.

<sup>3</sup> Personal experience has taught me this.

This process of uncovering and examining garments occurred over a number of days. Overall, I must have looked at close to 70 items at BCPV. The dates of these items ranged from the 1820s up to the mid twentieth century, but in spite of the range of garments I found, there were not enough to create a thorough enough group. The list of possible garments was made up of: two garments in purple, two in blue, and one in red. The next step was to see whether OM had any other items that could be added to the list.

OM offered another wonderful selection of garments and as it happened, purple seemed to be the most plentiful colour. I examined seven garments in total, with dates ranging from the late 1700s to the 1920s. The one garment that caught my eye and fit with BCPV's list of potential artifacts was made of purple silk with printed white dots. It was a stunning piece and completed the collection of garments I needed for my research perfectly. I now had a collection of three garments of the same colour family covering a forty-year span: one garment dating about 1865, another dating 1887, and the third circa 1900.

The next step was to have each of the purple fabrics analyzed. To determine which dyes, either synthetic or natural, as well as any other chemicals that were used, specialized methods were necessary specifically, a gas-chromatography-mass spectroscopy (GC-MS) and an electron microscopy/energy dispersive spectrometry (SEM/EDS) available at the Canadian Conservation Institute in Ottawa. Synthetic dyes are also known as basic dyes or aniline dyes, compared to natural dyes which are derived from organic matter. With the permission from the museums, a small sample (less than the size of a pinkie-fingernail) was cut from each garment, collected from an inconspicuous place such the seam allowance in the shoulder or the underside of the skirt (McClung Fleming 1974, 156; Prown 1982, 7 and 8). The results from these tests proved that both

synthetic and natural dyes had been used in each garment. I will explain these in more detail in Chapter One.

## The Two Histories of Purple

“...This is the purple for which the Roman fasces and axes clear a way. It is the badge of noble youth; it distinguishes the senator from the knight; it is called in to appease the gods. It brightens every garment, and share with gold the glory of the triumph. For these reasons we must pardon the mad desire for purple” (Pliny the Elder, *Natural History*, 9:36; Ball 2003, 189-9).

Every colour has its own social relevance that changes over time and place. In the western world purple was the colour of nobility for the ancient Egyptian pharaohs, Roman emperors, and Babylonian kings. The most expensive shade was Tyrian Purple obtained from the *Murex trunculus* mollusks found in the Mediterranean Sea (Krafts, Hempelmann, and Oleksyn 2011, 7-9). The process to obtain this dye was labourious and expensive, adding to the elite nature of this colour. From as early as 1600 BC, the ancient Phoenicians, Egyptians, Greeks and Romans each considered purple as the colour for nobility and religious leaders. This spread to parts of the Mediterranean and Europe (Finlay 2002, 390-434). Purple was also a colour of status in Polynesia and Central America (Varichon 2006, 141). It also was a popular colour for kimonos during the Hien dynasty (794-1185 A.D.) in Japan (Varichon 2006, 204,138). With the collapse of the Roman Empire, the use of the mollusks and royal purple fabric fell too (Kay-Williams 2013, 9). However it remained an expensive colour that only the upper classes could don (Varichon 2006, 204). By the mid-nineteenth century purple became attainable to the masses to due advancements in chemistry and the textile industry.

The extant garments help to explore the colour purple from a Canadian perspective. The results opened up two histories of the colour purple in this thesis. The first history explores the

origins of the dyestuffs used in these garments. The second history follows the owner and wearer of Garment B. Clara Bell Waddell, resident of Hamilton, Ontario from 1861 until 1921. It also follows her purple garment to examine the possible reasons why purple was chosen in southern Ontario during the latter half of the nineteenth century.

In Chapter Two and Three, I expand on the results with a look at the history of the dyestuffs in order to consider the possible origins of the raw materials and how they were processed, thereby providing a history of all the materials that have gone into the making of the garments. The tests carried out for this thesis prove that both synthetic and natural dyes were used to dye the fabric for each garment. This dual use of natural and synthetic dyes over the thirty-five-year arc shows the transition continued until the turn of the twentieth century, with dyers using the durability of natural dyes in conjunction with the vivid colours of the synthetic dyes. While the aniline dyes were vibrant like no dye before, they were not as colourfast as their natural counterparts, and so the colours faded over time (Poulin and Duguay 2013, 4).<sup>5</sup> In some cases dyers found a balance, as seen by the results from the tests of the three garments, by continuing to use the tried and true natural substances together with the new synthetic options (Casselman 2008, 21 and 2006, 156). By analyzing three garments over a period of 40 years, I am able to prove this is true.

The third chapter follows the second garment (Garment B) and Clara Bell Waddell. I begin at the store where the garment was built and purchased. Next we find the dress at the church where she was married, and continue following the garment to other possible locations where it was

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<sup>5</sup> Colourfast means a fabric's ability to keep colour. Dyes can bleed colour with wear or laundering. Fabrics can fade with exposure to light. Both natural and synthetic dyes can have difficulty retaining their colour. Today's deep-blue denim jeans are excellent examples of dyes that bleed its colour when washed. Some natural dyes can be more colourfast than some synthetics, and vice-versa.

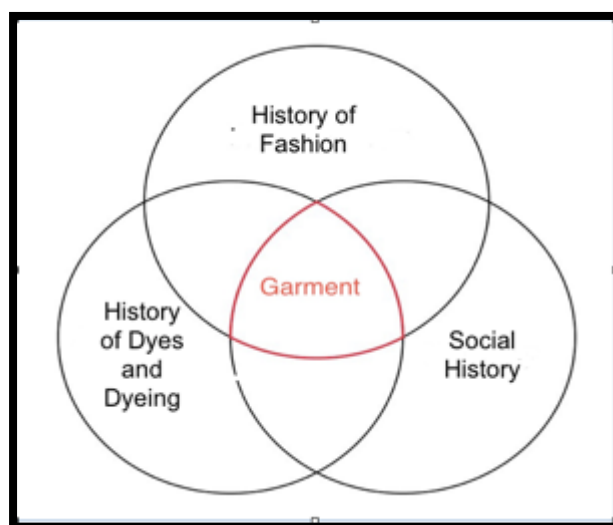
worn. The final location is BCPV where it was donated in 1970. I used Canadian census records from 1861 through to 1921, wedding, death, and birth registries, city directories, newspaper articles, programs, and a church yearbook to piece together Clara and her family's lives. I also felt it important to take the "follow the person" more literally and visited the locations in Hamilton and Toronto that were part of the garment's journey.

### The Purple in Context

There are other studies that cover purple and fashion; however, there are significant differences from those studies and the work I have undertaken. *Fashion Victims: The Dangers of Dress Past and Present* (2015) by Alison Matthews David explores the popularity of purple during the mid 1800s. So prevalent were clothing items dyed with mauveine that Punch Magazine labelled the fad "Mauve Measles" (Matthews David 2015, 107-109). Matthews David also had artifacts tested for their chemical colourants. Her focus, like the title indicates, examines the negative side effects certain dyes both to dyers and wearers (Matthews David 2015, 107-115).

Patricia E. Bovey's *Bustles and Rosepetals: Fashion is Art 1882-1910* (1980) covers very similar ground. Bovey uses extant garments to survey fashion in relation to customs, politics, design, colour, technology, and art. She mentions the use of natural sources that were used to create colour palettes: "the resulting colours were soft and rich ... The shading was subtle although the colours were sometimes uneven..." (Bovey 1980, 29). She notes the use of aniline dyes that were used "alongside" (not necessarily in conjunction with) natural dyes (Bovey 1980, 29). She adds that colours from synthetic dyes give textiles the richness of colour that could not be achieved with natural dyes. Her next claim is that the aniline dyes were "labour saving" and "available

commercially” although neither of these claims are cited or supported (Bovey 1980, 29). Bovey also noted how these new colours changed the fashion world, maintaining that the new range of colours “entered wardrobes at first in garments such as tea gowns which were only worn at home”. The example she uses is a bright purple velvet tea gown dating between 1895-1900. It is clear from the garments used for my study that this is simply not true. Bovey does add that rust, brown and wine shades were popular during the last 18 years of the nineteenth-century, as evidenced by the other garments mentioned in the previous works as well as those that can be found in the collections at Black Creek Pioneer Village and Oakville Museum (Bovey 1980, 29). Her final assertion is that colours, especially “yellow, purple and stronger pinks”, became increasingly popular for both day and eveningwear by the end of the twentieth century and this trend continued into the twenty-first, asserting that artists, especially French ones, influenced the range of colour in fashion. This tendency was also aided by further developments in the chemical dye industry. Bovey’s former claim regarding colour is inconsistent with this study’s extant garments.



**Figure 1:** Use of garment and how it links the three areas of study together (A. Gilbert)

As an interdisciplinary student it was imperative that I explore costume history, social history and the history of dyes and dyeing equally. Using garments as the focal point allowed me to branch off and explore these subjects (Figure 1). Material culture based methodology also provided a way to bring my two and a half decades of experience as theatrical costumer to shed light on an intimate social history from a Canadian perspective.

Initially, my goal was to only focus on the transition of natural to synthetic dyes. The garments and the results from the tests provided further direction for my thesis. By researching the dyes and the information in the accession files I discovered there was an area of study that needed exploring.

Most books on Canadian fashion, for examples, are thin 8" x 11" editions, with mostly hand drawn or black and white images. Compared to the large and colourful tomes on British and American fashion, textiles, and manufacturing, the information in these areas is definitely lacking. Very little can be found on the dyeing and fabric manufacturing- specifically in regards to silk- in Canada. This thesis will provide some insight into the Canadian fashion industry: the makers, the sellers and the wearers.



## Chapter 1: Meet the Garments

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In this Chapter I describe each garment in detail, focusing on the cut, the construction, the materials, and most importantly the colour. I also note the wear, alterations, and other notable features that lie within the seams.

### Garment A: A Dress and Cape

The three garments are introduced in this chapter, beginning with the oldest – 2006.5.1 or Garment A, from Black Creek Pioneer Village. It is made up of four pieces: 2006.5.1a (the bodice), 2006.5.1b (the skirt), 2006.5.1c (the cape), and 2006.5.1 (the belt) (Figure 2).



**Figure 2:** Bodice, Skirt, Belt and Cape (A. Gilbert)

Garment A was a piece the BCPV staff were very excited about, mostly because of its colour: a most stunning shade of purple. All the fabric, trim, ribbon, fringe, and buttons were dyed the same colour. Garment A has been dated to about 1865 by the staff at BCPV, who assessed the

style, fabric and construction of the garment when it was donated and again when the staff and I were examining the garment together. I've included images of another similar garment from 1867 to provide an example of what Garment A looks like when worn (Figures 6 and 7). This comparison garment shows the cut and silhouette of the garment as well as the trim that is the same colour as the fabric. One of the most vital clues as to when the fabric was dyed lies along the selvage edge (Figures 3 and 4). There is a white band that follows the finished edge. This indicates that the fibres were dyed prior to being woven, rather than once it had become a piece of fabric. The notions must have been dyed at the same time as the threads in order for them to be the same colour.<sup>6</sup> If it were not for the white stripe, one would think the fabric and notions had been dyed after the fabric had been woven.



Figure 3:  
Garment A Bodice Front

Visibly worn buttons and  
matching trim on sleeve  
Notice the white selvage edge

(A. Gilbert)



Figure 4:  
Garment A Interior of Bodice  
Note the white selvage edge

(A. Gilbert)

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<sup>6</sup> Notions include anything added to a garment. Some examples are: ribbon, fringe, buttons, snaps, hooks, bars and thread.

The cut of the six paneled-bodice supports this date. The bodice is quite high-waisted with two deep waist darts in the front two panels. The bodice is backed with cream-coloured cotton and is sewn together by machine. The armhole/armscye is dropped so it would sit on the wearer's arm, rather than on the shoulder head (Arnold 1966, 24-5; Collard 1975, 13). The garment has a high neck with a small stand collar, and the buttons that close the bodice along the centre front show wear. There is evidence that alterations were made to the side seams, expanding them for use at a later date for either the original wearer who had grown or another person who was larger in girth. The buttons have also been moved to accommodate this different body. There is also an addition of a purple velvet ribbon to the collar. One can see the subtle difference between the ribbon on the bodice, which is slightly redder and more pristine (right in image below) and the ribbon on the cape, which is slightly bluer and more worn (Figure 5).



**Figure 5: Cape, back (left)  
Bodice, front open (right)**

The cape has the original trim,  
while the bodice has  
new trim has been added

(A. Gilbert)

The cut of the skirt is another feature that dates this garment to the mid-1860s. The panels of the skirt are gored, with most of its fullness towards the back. The skirt is also narrower than some of the other skirts from this time, pushing the date of the dress closer to the mid-to-late 1860s. This skirt would have required a crinoline to maintain the silhouette (Collard 1980, 7). Alterations have also been made to the skirt as well as the bodice. The waistband has been

removed and then reapplied and the pleating modified to make it larger to match the bodice.

There is a piece of velvet ribbon, the same found on the collar that outlines a pocket in the skirt.

Along about one quarter of the hem of the skirt is a very faint band of colour that is a slightly different shade than the rest of the skirt. Perhaps a ribbon had been attached and then later removed. The band would have kept light from fading this portion of the skirt, now revealing the slightly stronger colour.

The cape and the belt have not been altered. The cape appears to be slightly more faded than the rest of the garment pieces. This would have been a very practical but well trimmed component of Garment A (Blum 1974, 15-16). The belt is also another fashion feature of the 1860s dress. It measures smaller than the skirt and bodice because of their modifications, suggesting the original smaller size of the wearer. The overall condition of this garment is good. Aside from wear on the bodice and cape, slight fading of the skirt and a few holes from insects, the colour and fabric have remained in decent shape and are a delightful example of Canadian fashion, in both cut and colour, at the time of Confederation.



Figure 6: Comparison dress for Garment A front view  
(French Silk Dress c.1867. The Met Museum  
<https://www.metmuseum.org/art/collection/search/84001>



Figure 7: Comparison dress for Garment A rear view  
(French Silk Dress c.1867. The Met Museum  
<https://www.metmuseum.org/art/collection/search/84001>

## Garment B: Clara's Dress

Like Garment A, Garment B is from BCPV, accession number 1971.70.22. It was donated in 1971 and also has four items under its accession number: 71.70.22a (Bodice 2, complete with sleeves) 71.70.22b (Bodice 1 is incomplete, missing sleeves, trim and buttons), 71.70.22c (incomplete skirt) and 71.70.22d (velvet train). According to the notes in Black Creek Pioneer Village's files, this garment dates to the late 1880s. A note left by the donor states the garment belonged to Clara Belle Waddell and was worn in June 1887. The cut of the bodices, their collars, the details on the sleeves as well as the pleating and structure of the skirt all indicate this to be true (Arnold 1966, 38-9; Collard 1979 47-67; Cunnington 1990, 336-349).



Figure 8: Garment B, Bodice 1, Front  
(A. Gilbert)



Figure 9: Garment B, Bodice 1, Back  
(A. Gilbert)

Bodice 1 is made from pale lilac silk and purple silk velvet (Figures 8 and 9). This garment has two different shades of purple. For the purpose of this study and consistency with Garments A



and C, the attention remained on the darker purple velvet, rather than the paler silk. For the analysis the sample of purple velvet from this bodice, discretely from the shoulder seam. Along the centre back of the purple velvet seam is white edging along the selvage edge, similar to Garment A. The purple velvet shows very little signs of fading in colour. The purple is a deeper shade than Garments A and C. The pile of velvets can vary in depth and plushness. Light is absorbed in a different way with velvet because of the pile of the fabric, which can make it seem darker or lighter. Evidence of this can be seen in the photo of the bodice insert. The colour looks almost black.



Figure 10:  
The selvage edge of Garment B, Bodice 1

Note how dark the purple velvet appears in this image  
(The purple/blue behind the fabric is my gloved hand-  
I am lifting the seam allowance to help  
see the white stripe more clearly)

(A. Gilbert)

The main body of Bodice 1 consists of 10 pieces that have been machine sewn. The two panels on the bodice made with lilac silk have two wide waist darts with a panel of purple velvet down the centre. The back mirrors the front, with six panels in the back and a velvet piece in the centre. The bodice is lined with beige cotton and the seams were finished by hand, which is common to other bodices found in this collection as well as garments at the Oakville Museum. The shape of the bodice pieces is also in line with other bodices from the late 1880s, creating the S-shaped silhouette that was popular in Canada, America and Europe. Adding stiffness to this extreme shape are encased bones (either made of whale bone or metal) that have been machine

stitched to the seam allowances. Other details of this bodice are the collar and the pleating down the front, which are typical of the era (Collard 1980, 47 and 50). This pleating would have given a pigeon-chested look, as would the padding that was sewn to the inside of the bodice. The bodice opens in the front and has a series of white buttons that extend the full length of the right side and a small section of buttons that attach the insert on the upper left side. (Arnold 1966, 38) To keep the bodice in place is a waist-tape, made of plain cotton twill with hooks and bars; it is hand-sewn to the centre back seam. There is evidence of wear, with sweat stains that can be seen on the lower side of the armhole. This bodice has been altered and the sleeves removed. The sleeves could have been made of the pale lilac or the purple velvet, as garments made with contrasting colours were common during this time (Bovey 1980, 25; Collard 1979, 49). While the fabric is in overall decent condition with some fading and dirt (most likely from wear or storage prior to donation), it is unlikely this garment would be placed on display.

Bodice 2 in the Garment B collection has a similar shape to Bodice 1, minus the added inserts at the centre front and back (Figure 11 and 12). Bodice 2 instead consists of eight panels, backed with dark tan cotton. The seams were finished by hand and have boning sewn onto the seam allowances as in the case of Bodice 1. Rather than padding, there are two slits cut into the tan cotton backing, one on either side in the breast area. These slits would have formed the S-shaped silhouette by allowing the pleating in the front to splay apart. This bodice also has a high collar, but this one is decorated with cream silk chiffon. This silk chiffon has also been added to the centre front panel and the cuffs, along with some metallic trim; it decorates the centre back as rosettes. Metallic lace has been hand-sewn to the front panels at the base of the hem. The sleeves are not the typical simple tailored shape of the 1880s (Arnold 1966, 38-9; Collard 1979, 55-6, 62-3). They



have lots of pleating, darting and gathering which made them a lot fuller. As with Bodice 1, there is a waist-tape, but this tape is made of silk and has the name “A. Murray & Co. Hamilton” woven into the tape on the right side (Figure 13). It is attached with the same stitches as in Bodice 1, suggesting that this garment-maker made both bodices. There is also evidence of wear with sweat stains in the underarm area, and remaining on the left armhole is a woollen jersey dress shield.



Figure 11: Garment B (Front)  
(A. Gilbert)



Figure 12: Garment B (Back)  
(A. Gilbert)



Figure 13: Garment B  
Close up of label  
(A. Gilbert)

The train in the Garment B collection could have been worn with either Bodice 1 or 2. It is made from the same purple velvet as the inserts in Bodice 1. The entire upper layer of the train is made from the velvet, and there is a lilac cotton lining (Figures 14 and 15). The underside of the perimeter is edged with pleated cream netting. A purple silk ribbon sits on the underside at the bottom centre and is used as a handhold for ease of movement. As can be seen in the images below, there are faced patches on the cotton layer. The waist is accordion pleated and hand sewn in place. It is attached to a cotton waistband. The train would sit on top of the skirt and under the bodice.



Figure 14:  
Velvet Train at Waist

Accordion pleating  
with cotton belt

(A. Gilbert)



Figure 15:  
Underside of velvet train,  
with cotton lining

Note the faded sections

(A. Gilbert)

The skirt is the final piece of Garment B. It is made of the same lilac as Bodice 1 and 2. Like Bodice 1, it is also incomplete – its front panel has been removed. There are several possibilities for what the front panel could have been made from. One could be the lilac silk, or the purple velvet, or even the chiffon silk from Bodice 2. It could have been another type of fabric entirely; a lace perhaps, later removed to make another garment, accessory, or trim. The back of the skirt is heavily pleated in order to create the bustled silhouette of the late 1880s (Collard 1980, 56-7; MacKay 2007, 47-48). The fabric of the skirt, like the bodices, is faded in places but one can see how bright the lilac colour once was. The fabric that is hidden on the underside of the back closure has been protected from the elements (Figures 16 and 17). The skirt would have been worn with petticoats and some kind of bustle structure, either of horsehair or a more complicated wire cage, to create the popular 1880s silhouette. I have included 3 images of similar garments (see Figures 18, 19 and 20) to see how garments from the 1880s were typically shaped. In particular the skirt, bodice and sleeves).



Figure 16:  
Garment B Skirt, Back View

This view shows the complex pleating, and measures taken to keep the pleating in place

Also note the lilac silk by the purple glove on the left, showing the depth of colour

(A. Gilbert)



Figure 17: Garment B Skirt, Front View

This view shows the hem, stiffened lace and the missing panel in the front exposing the white and beige cotton fabrics of the under-structure

(A. Gilbert)

Overall, Garment B was at one point a stunning item of clothing. According to the note found in the accession file, a young woman wore it on her wedding day, as well as on several other occasions during the late 1880s in southern Ontario.<sup>6</sup> A choice was made to combine the lilac silk with the silk velvet. Our modern aesthetic and traditions have ladies wearing white for their weddings, but this was not the norm in late nineteenth-century Canada (<https://www.historymuseum.ca/confederationdress/womens-wear/rites-of-passage.php>). The evidence of wear on all pieces of Garment B, but especially on Bodices 1 and 2, show the garment was worn on more than one occasion, either with Bodice 1 or Bodice 2. The skirt was altered and the fabric was potentially used for a different garment and occasion, keeping in the Victorian tradition of re-using fabrics.



Figure 18: Comparison Garment for Garment B, Bodice 1. Front View

(American Silk Dress c.1884.  
The Met Museum  
[www.metmuseum.org/art/collection/search/107022](http://www.metmuseum.org/art/collection/search/107022))

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<sup>6</sup> This assumption is based upon the hand-written note left by the donor in the accession file.





Figure 19 and 20: Comparison dress for Garment B, Bodice 1 side view and rear view  
(Visiting dress c. 1889, The Met Museum,  
[http://images.metmuseum.org/CRDImages/ci/weblarge/Ci57.48ab\\_S.jpg](http://images.metmuseum.org/CRDImages/ci/weblarge/Ci57.48ab_S.jpg))

### Garment C: The Polka Dot Dress

The final artifact, Garment C, Oakville Museum artifact 1985.7.12, comes with a bodice 1985.7.12a and a matching skirt 1985.7.12b (Figures 21, 22). It dates around 1900, according to notes in the Oakville Museum. This garment consists of two pieces, a bodice and a skirt. It too has been dyed a rich shade of purple, closer in tone to Garment A. This lightweight twill weave silk has white polka dots printed on top of the purple. Compared to Garments A and B, this artifact is in the best condition. It has never been altered and shows few signs of wear, as well as being free from damage by insects. There are, however, faded sections throughout the garment where the purple colour has turned a bright pink. The faded sections range in size from small dots to larger blotchy

patches. The style of the garment and the cut of the skirt and bodice along with the added padding at the chest support the date of 1900.



Figure 21: Garment C Front View (A. Gilbert)



Figure 22: Garment C, View  
from hem

(A. Gilbert)



Figure 23: Example of selvage edge

(This is found along seam, there is no extra colour woven in so it is difficult to detect)

(A. Gilbert)

Garment C's selvage edge differs from those of Garments A and B (Figure 23). While with the first two we can see a different coloured stripe, this is not the case with Garment C. This implies that the fabric could have been dyed after the fabric was woven. The white dots were printed on the dyed yardage after it had been dyed purple. What is interesting about this garment is the choice of colour. In 1900, Edwardians tended to pick more muted, tertiary colours, rather than the brighter colours of the 1860s and 1870s (like Garment B) (Matthews David 2015, 105). The dye analysis indicates this fabric came from an earlier time and this garment was built with older fabric. The wearer could also have wanted to buck the trend and sport a favourite colour rather than conform to the pressures of fashion.

The entire bodice is backed with black polished cotton and machine sewn together, while the seams are finished by hand. The front of the bodice has been cut to look like a jacket with a cream silk "false" blouse or "false" front underneath the jacket layer. The false blouse has a neckline with a high collar. Attached to the left side of the blouse edge is a small rounded pocket (Collard 1975, 39, 45, 47). The jacket front has a much lower neckline with a curved collar attached to the top edge. The collar is made with the same purple silk and is finished with cream lace and a black velvet ribbon. The same lace has been used to edge the centre front opening of the jacket. Both the false



blouse and the jacket front have hook and eye closures. The hem of the bodice both in the front and the back has gathers sewn into place, which is also a common feature of garments from the turn of the century, giving a bloused appearance. The extra padding located at the upper part of the chest helps the wearer achieve this full-fronted silhouette.

The sleeves were cut into two pieces and shaped to follow the curve of the arm. The sleeves have a small amount of gathering at the sleeve head, which mirror the tamer, far less full sleeve that became popular at the end of the nineteenth and early twentieth centuries. The cuffs are decorated with two scalloped pieces faced with the same purple silk edged in a plain cream ribbon. This detail mirrors the rounded collar of the jacket front.

The skirt has two layers and is also cut with the same purple silk and lined with the same black cotton as the bodice. Tucked away under the top layer is a label stamped onto the black cotton that states “Nubian Fast Black”. The top layer extends from the waistband and has a triangular hem that sits  $\frac{3}{4}$  of the way down. The longer point of the hem sits at the centre front and the shorter section sits at the sides. The hem is finished with wide lace that sits just above a ruffle. What is interesting about the hem of the ruffle is that it has been machine sewn rather than hand sewn, as the hem of the under layer was. This would have made for the faster construction of this garment because of the amount of ruffle that has been attached to this skirt. The under layer is also attached to the waistband, but the section that is covered by the top layer is made of only the black cotton. This would have saved money by using less of the purple silk fabric for the under layer. Having one less layer of fabric also reduces bulk. The under layer is ground length in the front and has a slight train that extends at the back. The waistband is a black plain weave ribbon and has two large hooks and eyes to keep the skirt closed. There is a large pocket sewn into the right-side

seam of the under layer, which can only be accessed by lifting the top layer. This would not have been a pocket the wearer would have reached for in public.

I have included a comparison garment for Garment C. It a very good example of the bodice and skirt shape (Figure 24). The sleeves however are fuller than the purple polka dot dress.



Figure 24: Comparison Garment for Garment C

(American Silk and Cotton Dress, 1903. The Met Museum [www.metmuseum.org/art/collection/search/158207](http://www.metmuseum.org/art/collection/search/158207))

## Dye Results at a Glance

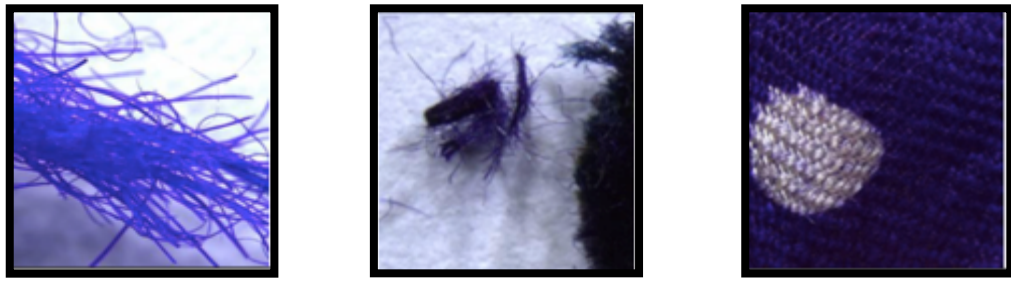


Figure 25: Up close view of Garment A, B and C (Poulin and Duguay 2013, 3)

### Garment A

The fabric, velvet ribbon, fringe, button, and trim are all the same colour purple. This was a common design feature for dresses from the 1860s and 70s. Because of the identical colour for all of these components, it is very likely that all the materials for the garment were dyed at the same time.

The results from the dye analysis indicate that Garment A was dyed using brazilwood, a natural dye, and two synthetic dyes, Basic Violet 1 and Basic Violet 14. The tests performed by CCS detected not only dye substances but also all chemicals, including mordants that were found in the fibres. Mordants are used to make a dyestuff more colourfast or to enhance or change the colour of the dye results. Often they are of metal, such as aluminum, iron, copper, tin, arsenic sulphide, and lead (Dronsfield and Edmonds 2001, 31). They are used to make the chemical reaction necessary for the dyestuffs to adhere to the fibres, to enhance or change a colour or to make the colours more colourfast. The tests also showed that traces of aluminum were present signifying the use of aluminum as a mordant (Poulin and Duguay 2013, 2). Aluminum could have been used separately from the dye mixture or mixed into the same dye bath. What is unknown are the amounts of each dye needed to produce this garment's colour, and in which order; if they were used in three individual dye vats or if the synthetic chemicals were used in one bath while the

natural dye was in another, or if all three dyes were used simultaneously. Basic Violet 1 was first discovered in 1861 and Basic Violet 14 in 1858 which both help to confirm the date of Garment A to 1865.

### **Garment B**

While Garment B's purple velvet portions are a slightly darker shade than Garment A or C, the dyes and chemicals that were used have overlapping similarities. The synthetic basic dyes were found to be Basic Violet 1 and Basic Green 4. Basic Violet 1 was also located in Garment A, while Basic Green 4 is also in Garment C. While the note, the cut and style of Garment B, all support the dating of this garment to 1887, the identification of Basic Green 4, invented in 1877-8, provides further evidence. Garment B is the only garment that used the natural dye indigo. Traces of aluminum were also detected, which could indicate the use of alum as a mordant and/or traces of dirt.

### **Garment C**

The results from the analysis indicate that Basic Violet 14 and Basic Green 4 and brazilwood were used to dye Garment C purple. Like Garment A, Garment C was also dyed with brazilwood and Basic Violet 14, with Garment B also using Basic Green 4 to colour the purple velvet. There were no mordants detected with the analysis. There is conflicting research regarding the colourfastness of brazilwood without a mordant. While some sources claim brazilwood was not very fast (Nieto-Galan 2010 3), other sources state that it was often used alone and could produce a range of purples and reds with or without mordants (Cardon 2007, 285). Another curious detail is the use of Basic Green 4 in this garment as well as in Garment B. The difference is that Garment B used indigo

rather than brazilwood. Basic Green 4 dyes a very turquoise shade of green; a shade of green with a lot of blue. Green mixed with red produces a brown colour, so an interesting choice when the result was a bright shade of purple. The analysis does not indicate how much of each ingredient was used, so it is not known how deep a shade of either colour was achieved during the dye process. Basic Violet 14 on the other hand is quite a vivid shade of purple. What is also unclear is in which combination these dyestuffs were used. It is possible that each was used separately or the brazilwood used independently from the basic dyes or all three used together.

What should also be mentioned for Garment C is that while the construction, cut, and design is clearly from 1900, the fabric may have been woven, dyed and printed at a much earlier time. We know that these synthetic dyes were available since 1877, ergo the fabric could be older than the garment. The wearer or the dressmaker could have purchased this fabric at a much earlier date. A stash of fabric is not uncommon with those who sew. This could also explain the use of such a vivid purple colour, which was seemingly more popular during the mid-1800s, rather than the more muted, “sophisticated” colours of the Edwardian era (Lopez 1992, 36).

This close reading of the garments, as well as the test results, indicate the surprising history of dyes and dyeing. From this point we return to the origins of the colour purple.

Garment	Natural Dye	Synthetic Dye	Mordant Analysis
A 2006.5.1 Date: 1867	Brazilwood	Basic Violet 1 Basic Violet 14	+ carbon - oxygen, silicon trace: sulphur, aluminum, silicon, calcium (The detection of traces of aluminum using SEM/EDS may indicate an alum mordant and /or traces of dirt (such as aluminum silicates) on the fibres.
B 71.70.22 Date: 1887	Indigo	Basic Violet 1 Basic Green 4	+ carbon - oxygen trace: magnesium, sulphur, sodium, aluminum (The detection of traces of aluminum using SEM/EDS may indicate an alum mordant and /or traces of dirt (such as aluminum silicates) on the fibres.)
C 1985.7.12 Date: 1900	Brazilwood	Basic Violet 14 Basic Green 4	+ carbon - oxygen trace: silicon, sulphur, sodium, magnesium (no metal mordants indicated)

Table 1. Results Breakdown from all dyes used in the three garments

Dyestuff	Description	Colour It Produces
Brazilwood	Hardwood from South America	Red but can be more purple colour depending on mordant -Potential alum mordant for Garment A -No mordant detected for Garment C
Indigo	India and countries with tropical climates	Blue but can be more purple depending on mordant -Potential for alum mordant for Garment B
Basic Violet 1	a.k.a. Methyl Violet Invented 1861	Purple
Basic Violet 14	a.k.a. Fuchsine Invented 1858	Bright reddish purple
Basic Green 4	a.k.a. Malachite Green Invented 1877	Blue-green/Teal

Table 2. Outline of dyestuffs detected in all three garments with colour breakdown

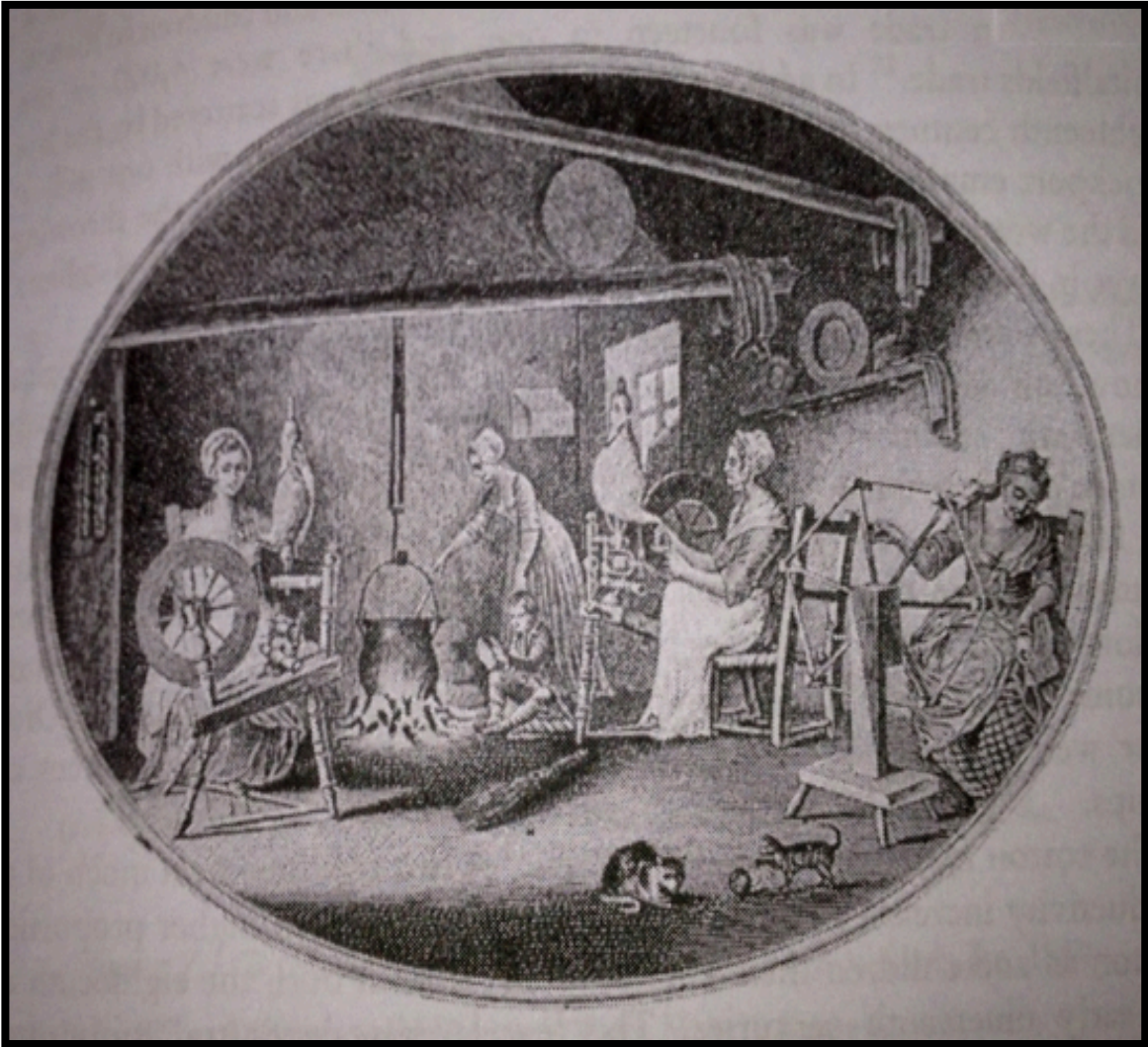


Figure 26: Flax spinning in County Down (Mary Evans Picture Library, Berg 1994, 139)

### The Process of Dyeing: Natural and Synthetic Dyes

In the image above (Figure 16), found in *The Age of Manufactures 1700-1820: Industry, Innovation and Work in Britain*, we can see two women at spinning wheels and another winding the spun yarn. In the background is a woman who is tending to a large vat over a roaring fire. She could be making dinner, but if this an image about the creation of textiles, this woman is more likely dyeing the



fibres yet to be spun, or that have just been spun, or are already woven fabric. Further, there is fabric hanging from the rafters, which could also be the fabric she has just dyed, drying overhead. This reminded me of the occasions when I had dyed fabric or clothing pieces for a stage production in a large cooking pot over a stove. Maxine Berg's *The Age of Manufactures 1700-1820: Industry, Innovation and Work in Britain* focuses on the textile industry and the changes in technology from the home to the factory. What I realized while reading this work was there is little mention of dyes; neither in regards to the locations of dye facilities or at what stage dyeing took place in the production of fabric or the labourers who dyed the textiles. This made me quite curious about where the colouration of textiles took place and how dyes were part of the vast process of taking raw materials and turning them into fabric.

New spinning, weaving, and textile machinery were introduced over the course of the eighteenth and nineteenth centuries, producing amounts of fabric at a rate that had not previously been possible. Techniques for colouring these textiles needed to keep up with the pace of manufacture. New methods were sought out to find dyestuffs, mordants, bleaches, and new processes that could keep pace with production.

Traditional dye sources or natural dyes were used during this time. These are categorized into three groups: animals (molluscs and insects), minerals (lapis lazuli, ochre and malachite), but most common were plants. Plants included leaves, roots, wood, seeds, bark, lichen, and stems. All these raw materials needed to be processed and converted into viable substances. Some of these dyes are very simple; for instance tea leaves, which are used frequently for tinting white clothing in the theatre. The leaves have been dried, but to make them useful as a dye, the leaves need to be boiled to create the dye-bath for the fabric to be immersed into to obtain the right colour.

Plant-based dyes such as brazilwood and indigo, which are the ones found in this study's artifacts and which I detail in my history in the later part of this chapter, require time to allow these raw materials to grow until they are ripe enough or old enough to be used. In addition to time, space is also a requirement. Fields that were once dedicated to growing food were now being used to grow indigo plants (Balfour-Paul 1998, 71). In cases like the brazilwood trees, the forest-covered coastline of Brazil was stripped of its indigenous plants in order to provide trees for dyes. Today these trees are protected to re-establish growth (Casselman 2008, 28; Cardon 2007, 277-8).

In order to become a dye, these natural substances need to be processed in some way; either by crushing, drying, boiling, and/or fermenting the substance. Other times the raw goods are treated with chemicals. These processes blur the definition of 'natural'. Prior to the discovery in 1828 of ammonia, the fermentation process used either lime or urine – either human or animal – that was sifted of impurities (Anora 2009, 64-5). The search for new substances continued, creating a sector of dyes that fit neither the natural or synthetic definitions. These complex dyes, which are sometimes referred to as "proto-chemicals" or "combination dyes" (Casselman 2006, 154 and 2008, 21) or "semisynthetic dyes" (Nieto-Galan 2010, 187-189), include such colourants as: Turkey Red, Picric Yellow, Murexide, and French Purple.<sup>8</sup> These required additional chemicals (other than those from mordants) or animal dung to process the dyes. In *Colouring the Nation: A New In-depth Study of the Turkey Red Pattern Books in the National Museums of Scotland* (2011), authors Sally Tuckett and Stana Nenadic chose to incorporate material-based research. They investigate the

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<sup>8</sup> -Turkey Red is obtained by a complex recipe of which many versions existed during the nineteenth century. The combination of which created a fire hazard (Diadick Casselman 2006, 66). Madder was treated with alum and oil as mordants, in addition to sheep's dung, blood and urine (Diadick Casselman 2006, 93).

-Picric Yellow is obtained from phenol or carbolic acid, and used in combination with (Nieto-Galan 2010, 188).

-Murexide, also known as Roman Purple, was created by mixing uric acid, derived from guano (hardened bird droppings) and nitric acid (Nieto-Galan 2010, 188).

-French Purple made by treating lichens with alkaline or oxalic acid (Nieto-Galan 2010, 187-8).

pattern books, business papers, and catalogues that once belonged to Turkey Red textile manufacturers in Scotland. This paper focuses on dyestuffs and the colours of fabrics in order to understand the social implications of manufacturing, building, purchasing (Tuckett and Nenadic 2012, 161-182). This is the only study that I could find which uses similar methodologies and research topics similar to my own.

Adding further confusion to the characterisation of natural dyes is the matter of mordants. When mordants are used, it is another step in the dyeing process that can alter a dye (Anora 2009, 64). Like coal and many of the natural dyes, metals need to be processed in some way. Certain dyeing methods are as simple as using a cast iron pot when preparing the dye bath. Other processes require metals to be in powder or paste form and the fibres to be pre-treated before dyeing. The word 'natural' also implies a safer or less toxic method with minimal harmful effects on the wearer, the maker, and the environment, but this is not necessarily the case. An excellent example is arsenic. It was used extensively in the first half of the nineteenth century to create green dyes for clothing, paint, and wallpaper. It had disastrous effects on its users and wearers. People became covered in rashes and "crusted, scabby skin" or had inflamed eyes and were treated for arsenic poisoning, in some cases resulting in death (Matthews David 2015, 81-96).

Defining synthetic dyes is even more complex. The simplest definition is: one that is not natural and involves a deliberate chemical reaction (Farrar 1974, 32). At what point is something not natural? And while one does not always understand that a chemical reaction has taken place, natural dyes have their own "deliberate chemical reactions" (Farrar 1974, 32).

William Perkin's mauveine is often credited as the first synthetic dye (Dronsfield and Edmonds 2001, 28). Perkin, a seventeen-year old chemistry student at Royal College of Chemistry,

was working in the laboratory combining chemicals with benzene, derived from coal tar, in an effort to find a synthetic version of quinine, a popular drug used to help cure malaria. Coal tar, a waste product from coal gas, was in plentiful supply in the nineteenth century and scientists were eager to find uses for this black sludge (Dronsfield and Edmonds 2001, 60-62).<sup>9</sup> Like scholarly works, most inventions are built on the discoveries and inventions of others. For example, benzene was first produced in 1825, but it was not until 1845 that it was derived from coal tar. Benzene was then treated with nitro-chemicals to create nitrobenzene and then aniline – the essence of the basic or aniline dyes (Dronsfield Edmonds 2001, 27). Perkins himself noted the importance of this and stated, “...if it had not been for Bechamp converting nitrobenzene into aniline the coal tar industry could not have been started” (Dronsfield and Edmonds 2001, 64).

Other chemists prior to Perkin had found that by mixing certain chemicals with coal tar, derivatives could produce dyes. Such is the case with Pittacal, a coal tar-based dye, which has been claimed to be the first synthetic dyestuff. Karl Ludwig van Reichenbach created Pittacal in the 1830s by using beechwood tar from charcoal ovens, blending it with barium oxide, alcohol and ether. The product was used commercially as a blue dye (Kauffman 1977, 753). This dye was not as successful as mauveine. For reasons that are unclear it went out of use after twenty years, despite “its application to dyeing (as) easy as a dyeing agent” (Dronsfield and Edmonds 2001, 32).<sup>10</sup>

Against the advice of his supervisor August Wilhelm Hoffman, Perkin left his budding academic career to pursue the world of business. Inside factory fences, he began to produce

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<sup>9</sup> Coal gas was used for lighting indoors and out. This method of lighting began in the early 1800s.

<sup>10</sup> Here Dronsfield and Edmonds fail to clarify where this quote comes from and do not call it the first synthetic dyestuff. Nor do they explain why Pittacal went out of use. I could not find any sources to date that can explain any reason for its decline.

mauveine (as it became known) and make it commercially available.<sup>11</sup> It was a huge risk for Perkin, not only for his reputation, but also his family's finances. Before the dye could become industrially viable, Perkin needed to find a way to reproduce it in large quantities. He had several obstacles to overcome, including his own ignorance about manufacturing dye on a commercial scale. He had never been inside a chemical factory prior to this endeavour; and everything he knew came from what he had read (Dronsfield and Edmonds 2001, 63). Perkin, along with his partners, needed to overcome innumerable challenges, both mechanical and chemical, and to understand large-scale dyeing techniques and colourfastness on fabrics other than silk. All prior work had been small-scale in a laboratory, and special equipment was needed to convert vast amounts of benzene of adequate quality with economical ingredients. As well, benzene was not as readily available.

Next followed mastering the technique for dyeing immense quantities of fabric at one time with consistent, professional results (Dronsfield and Edmonds 2001, 63-67). Once Perkin presented his creation to the world, the synthetic dye industry exploded, with other scientists (including his former supervisor, Hoffman) working on their own methods to compete with this new coal tar dye (Dronsfield and Edmonds 2001, 10). Perkin's experiments continued to refine mauveine to be as successful with other fabric types such as wool and cotton as with silk (Dronsfield and Edmonds 2001, 67).

This new aniline dye was seen as a triumph of the relationship between science and industry, thus earning Perkin the credit of inventing the first synthetic dye (Dronsfield and Edmonds 2001, 26). However, researchers such as Nieto-Galan, Dronsfield and Edmonds, Casselman, and Travis, each emphasise that the credit for creating the first synthetic dye cannot go to one person; rather,

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<sup>11</sup> Mauveine was also known as: Tyrian Purple, Aniline purple, and Perkin's Violet.

it was due to years of lesser inventions which scientists were able to build upon. Perkin was not the first to invent a synthetic dye; instead he was the first to invent a commercially successful one, taking mauveine out of the laboratory and into the factory. He paved the way for the other chemists and dye companies that followed (Dronsfield and Edmonds 2001, 67). Nieto-Galan goes as far as to say that: “Perkin’s success in 1856 did not “revolutionize” dyeing; technological change from the natural to artificial dyestuffs took more than half a century of gradual transformations” (Nieto-Galan 2010, 195). Nieto-Galan also emphasizes the claim that synthetic dyes took time to establish their place in the dye sector as the main source of dyes Nieto-Galan 2010, 190). We can see this with the results from the three garments with both natural and synthetic dyes used to create the colour *purple*.

Soon after Perkin’s invention, companies all over Great Britain and Europe attempted to replicate his formula for success with new colour recipes. Many of these companies were initially manufacturers of natural dyestuffs (Hohenberg 1967, 38). In addition to new shades to put on the market, scientists were looking to improve synthetics to make them more colourfast and reliable like their natural counterparts.

There was an initial stronghold of invention and manufacture in Great Britain and France, and some parts of Switzerland (Travis 1993, 68 and 72; Hohenberg 1967, 38). Over the next few decades, Germany emerged as the leader in the synthetic dye industry due to several factors, including the relationships it fostered between universities and chemical businesses and their strategic actions regarding patents in Europe and North America (Hohenberg 1967, 68-70). Part of Germany’s success was also due to the migration of chemists from Switzerland, and even Hoffman

himself left Britain for Germany (Hohenberg 1967, 33). Britain's initial stronghold could not compete.

However, by 1870, the Germans and the Swiss took the lead in chemistry manufacture. Some noteworthy changes included France's chemists and colourists transferring to Switzerland due to their factories' mismanagement and severe patent infringements, taking their skills and knowledge with them (Travis 1993, 35-6, 74). Along with other German chemists, key companies like BASF (Badische Anilin und Soda Fabrik), Friederick Bayer and Co. (also known as Bayer and Co.), and CIBA (in Switzerland) were formed and then took the lead (Ponting 1981, 164; Travis 1993, 74). From the beginning, German companies like these produced excellent goods and were able to undercut their competitors' prices for their synthetic dyes. The removal of tariffs in Britain and the United States during the 1870s meant that Germany and Swiss companies were able to create 60% of the world's synthetic dyes in the following decades, 80% of which was exported (Travis 1993, 145, 209; Hohenberg 1967, 36). Interestingly, Britain still continued to play an important role in the production of aniline goods by providing coal tar and aniline (Hohenberg 1967, 26, 27, 40; Travis 1993, 239).

Once the discovery of synthetic dyes in 1856 was made, they were used in both domestic dye vats and large commercial factories. They continued to be used in combination with natural dyes until after 1918.<sup>12</sup> They created a wider range of colours for consumers to choose from. The common misconception is an "either/or scenario" with the two types of dye. Dyers did not cease to use their natural supplies once the aniline dyes arrived on the market. Nor did dyers only use the

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<sup>12</sup> Synthetic dyes were increasingly becoming the main colourant source for fabric production. Countries that produced textiles had limited access to synthetic dyes during the First World War because Germany produced a large percentage of the world's supply. Manufacturers turned to natural dyes during this time (Field 2001, 77-91).

synthetic dyes. They used them together, as can be seen with all three garments in this study.

“They are not mutually exclusive technologies, with the attributes of one offsetting the other”

(Casselman 2008, 21). The colourfastness of natural dyes was successfully used in conjunction with the brilliant colour of the synthetic dyes.

## **The Evolution of Dye Technology**

In the second part of this chapter, I follow these results by investigating the history, discovery, sources, and possible locations where these dyes and fibres were produced (Marcus 1995, 108-112). When a new piece of technology is invented it becomes part of a larger system, a system of: manufacture, production, cultivation, marketing, sales, use and adaptation. There are people, both creators and users of a product, all along this process, who provide changes to the final product. There is an integration process when a new item is introduced. It is not unlike other technologies like a refrigerator, a light bulb, or an automobile that have had many adaptations and modifications between their initial incarnations and today.

The fashion sector is no different. It serves a function (warmth, protection, modesty, for example) in combination with design and expression. The component parts of clothing and the fashion system are ever changing and evolving to adapt to new demands and to meet the needs of its users. And just like refrigerators, light bulbs, and cars, they are continuously redesigned to make them safer, more efficient, and more effective. How would we define their transitions - lengthy or not? In many ways, the transition is still on going, with the introduction of new products available every season and, with fast fashion, even faster. On one hand the transition to synthetic dyes may be considered completed, with the fashion world using synthetic dyes for commercially made



garments almost exclusively, while on the other hand the improvements and modifications are still continuing today.

## Following Things: From Seed to Silk

“Follow the people... the things... the metaphor... the story... the life”  
(Marcus 1995, 106-9)

To understand purple as a technology and a system, I begin with brazilwood and then indigo, followed by the synthetic dyes: Basic Violet 14, Basic Violet 1, and Basic Green 4 (chronological order of their discoveries). The journeys of the dyestuffs for each garment were different due to the technological developments during the nineteenth century - specifically, transportation and the growth in silk manufacture in Europe and North America. I will also explore the roles of silk - the common fibre used in all three garments. The result is a very global effort: the probable locations of the brazilwood from the coastline of Brazil (Cardon 2007 286; Gardner 1915 21), the indigo from India, (Balfour-Paul 1998, 59-67; Cardon 2007, 343; Delamare and Guineau 2000, 94-5), and the synthetic dyes from Europe (Hohenberg 1967, 36-38, 68-70; Ponting 1981, 164; Travis 1993, 35-36, 62-63, 72, 74, 145, 209).

### Brazilwood

“The history of Brazilwood, like logwood, tells us much about both the true motives behind the missions of the great explorers and the enormously important role formerly played by natural dyestuff in the world economy.”  
(Cardon 2007, 289)

Brazilin which is derived from brazilwood or *Caesalpinia spp.* was detected in both Garment A and C samples (Poulin and Duguay 2013, 4). Brazilwood is from the heartwood tree family, similar to many other kinds of heartwood such as pernambuco, sappanwood, and peachwood, which are

found around the world in places like South Asia and Central and South America (Cardon 2007, 274-280). For the purpose of this study, I will be focusing on the brazilwood tree from Brazil, South America. Before this South American species was discovered, these other heartwood trees – the pernambuco, sappanwood, and peachwood - were called brazilwood.

Christopher Columbus discovered the brazilwood trees during a return voyage in 1497 after reaching the shores of what is now Brazil. The coast of Brazil and neighbouring islands were covered deep with brazilwood forestation (Cardon 2007, 286; Gardner 1915, 21). So prevalent were these trees and iconic with the area that the name for the country came from the brazilwood tree. By the twentieth century brazilwood had become a protected species after logging stripped the land, and today very few trees are harvested.

It was a popular wood for violin bows, and the waste material was used for dyeing fabrics (Cardon 2007, 281). The part of the tree that is used for dyeing is the trunk, and varying in diameter from 40-70 centimetres (Cardon 2007, 277). The centre portion is yellow because it has not been exposed to the atmosphere, while the outer portion is a dark reddish colour. Brazilwood was shipped back to Europe either as logs or as blocks. Any portion not taken for bow making was chipped or rasped into chips, sawdust or powder, ready for the “aging” or oxidation process (Cardon 2007, 280-1; Gardner 1915, 21). This included either boiling the wood in water, then using it as the dye bath or putting the wood into wet mounds and letting these sit overnight. This latter method allowed the brazilwood to be used at a later date (Cardon 2007, 282; Gardner 1915, 21-2).



Figure 27: Brazilwood tree

(Dean, 78)

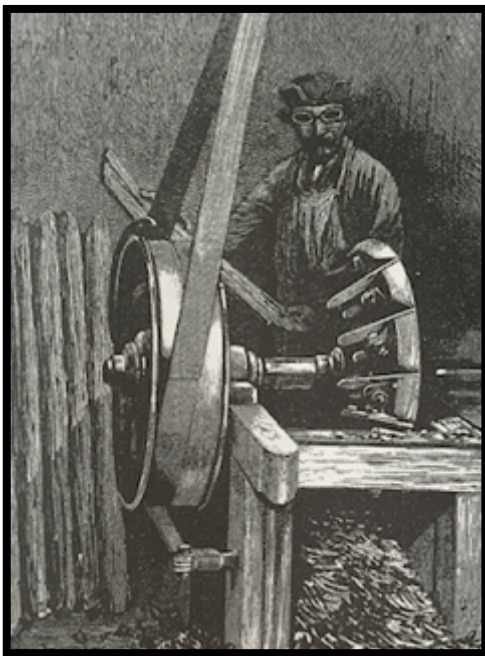


Figure 28: Dyewood being chipped

(Nieto-Galan 2010, 76)

Brazilwood could be used with or without mordants. In Garment A aluminum was detected. With the aluminum mordant brazilwood produces a crimson or bright red shade, as well as a more durable colour (the word 'Brazil' means bright red or flame colour (Ferreira 2004, 333; Gardner

1915, 21). However, in some dye baths an alkali was added to the brazilwood mixture to help make a bluer colour, rather than the crimson it was known for (Gardner 1915, 22). These reds used in conjunction with the aniline dyes would have been created to make the purple colours we see in Garments A and C.

The journey that brazilwood would have taken in the 1860s for Garment A would have been different than the one for Garment C, at the turn of the century. Europe, Britain and especially France, were the traditional centres for textile manufacture, but by the 1880s that changed, with a larger proportion of silk being manufactured in the United States and Canada.

#### **Indigo: India, Bengal**

“Once upon a time, or actually several times upon a time, indigo was the most important dye in the world.” (Finlay 2002, 352)

“Indigo therefore already had a long and prestigious history weathering the fluctuations of fashion...” (Cardon 2007, 335)

From the analysis performed on the samples, Garment B revealed that indigo; specifically, indigotin from the genus *Indigofera*, was used to dye velvet fibres (Poulin and Duguay 2013, 3). The word indigo means “from India” in Greek (Finlay 2002, 353). There are over 700 species of indigo, and they can be found all over the world, although usually confined to warmer, tropical areas in Asia, Africa and Central America. No native plants have been discovered in Australia or Europe (Cardon 2007, 353; Clark et al. 1993, 191). Each plant type has its own particular qualities. The *Indigofera tinctoria* species is the indigo plant that has been most widely used for large commercial indigo production. There are 42 varieties of these plants grown in India, of which “the best being the ones with a reddish/purplish tinge, their quality verifiable by taste and feel” (Belfour-Paul 1998, 76, 89-91).



Figure 29: Indigo leaves (Dean, 98)

Indigo dye has been used as a dye for nearly five thousand years. The Egyptians wrapped mummies with indigo dyed fabrics (Finlay 2002, 352). After it was introduced to Europe in the mid-sixth century, Indigo had its own struggles gaining acceptance by the European dye community. It was initially banned in several countries due to pressure from the woad-growing farmers. In Europe, the woad plant was the blue colourant of choice. Woad contains indigotin and dyes the same way as indigo. However more woad is needed to create the same intensity as indigo (Cardon 2007, 330, 368-374) Because of the stronger colours that indigo produced, the demand for indigo grew. Eventually, once the bans were lifted by the mid-1700s, indigo became an important source of trade, as well as tension, between the Portuguese, the Spanish, the Dutch and the British. During the 1600s plantations were established in the southern United States, the Caribbean, Java, and central and southern America (Balfour-Paul 1998, 59-67, 76-77; Cardon 2007, 358; Kay-Williams 2013, 82, 94, 96; Delamare and Guineau 2000, 94-5, Finlay 2002, 353, 354). In some of these areas sugar and coffee became the more popular product to grow, while the United States' indigo production slowed because of the American Revolution and halted due to the Civil War. In the nineteenth century, British and other European investors established large indigo factories mostly

in Bengal, but also in Madras and Bihar. By the end of the nineteenth century 400,000 tons of indigo was shipped around the globe from India and provided the majority of the world's supply (Balfour-Paul 1998, 59-67; Cardon 2007, 343, Feeser 2012, 148-9; Delamare and Guineau 2000, 94-5).

Indigo is mostly used to create blue dye but can also produce shades of purple, especially if mordants are used. Most dyes change the colour of fibres when they are in the dye bath. The almost magical quality of indigo is the fibres change colour once they are taken out of the bath and exposed to oxygen – the dye bath itself is colourless (Cardon 2007, 336, 341, Findlay 2002, 357). To attain a medium blue, 2-4 teaspoons of indigo are needed for 1 pound of silk ([www.maiwa.com](http://www.maiwa.com)).

The leaves are the part of the shrub that is collected, with often 3-4 harvests in one year (Cardon 2007, 361 and 358). There are different methods for processing the leaves and preserving the indigo. One method requires the leaves be dried and then ground into a powder (Cardon 2007, 341). Another way is to grind the fresh leaves and organize them into heaps, where they decompose. These masses are then formed into balls and then dried for later use (Cardon 2007, 342). The most complex technique is to crush the leaves and then cover them with water from 10 to 22 hours. It is then moved to another tank where an alkali (usually lime, wood ash lye, or sodium carbonate) is added (Cardon 2007, 341). In some cases, urine was used to assist with the fermentation of the leaves (Kay-Williams 2013, 19). The leaves decompose when they are in these mixtures and “sludge” sinks to the bottom.

The growing, harvesting and processing of indigo was labourious, especially in large-scale operations and so, its history has been associated with human exploitation and hardship. It was critical that the mixture be kept well oxygenated, and men and women, usually of the lowest

castes, were required to keep the vat moving.<sup>14</sup> So unpleasant was this task that the vat was also known as the “devil’s-tank” (Balfour-Paul 1998, 110-111; Cardon 2007, 343; Kay-Williams 2013, 19, 20). In some areas machinery, animal and steam power were used (Balfour-Paul 1998, 112).

Figure 20, shown below, is a powerful image of the European men standing over the Indian workers wading in the vats of soaking indigo leaves. The sticks would have helped keep the leaves from sticking to the bottom (Kay-Williams 2013, 19). This was not an uncommon sight in dye manufacturing sites in the late 19<sup>th</sup> century in India and throughout the world.<sup>14</sup> This shows some of the extremes that people have gone to in order to obtain specific colours for clothing (Balfour-Paul 1998, 111). This work was toxic, and some people became sick and developed cancer, headaches, or became impotent, while others died. The terrible fumes also attracted massive amounts of flies, which also made the workers sick (Balfour-Paul 1998, 64). This kind of processing was needed to make the indigo leaves viable for use as a dye.

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<sup>14</sup> In the southern states this work was done by the African American slaves (Balfour-Paul 1998, 111).

<sup>14</sup> *In the Skin of the Lion* vividly recounts life in a tannery in Toronto. These men would stand in vats of dye and keep the leather pieces moving to create even colouration of the hides. “The men who dyed the leather got longer time in the showers but the smell never left them” (Ondaatje 1996, 129). “And the men stepped out in colours up to their necks... the acrid texture already deep within them, stuck within every corner of their flesh” (Ondaatje 1996, 130). “That in winter this picturesque yard of colour (the hides that were just dyed) were even more beautiful...(Ondaatje 1996, 131).

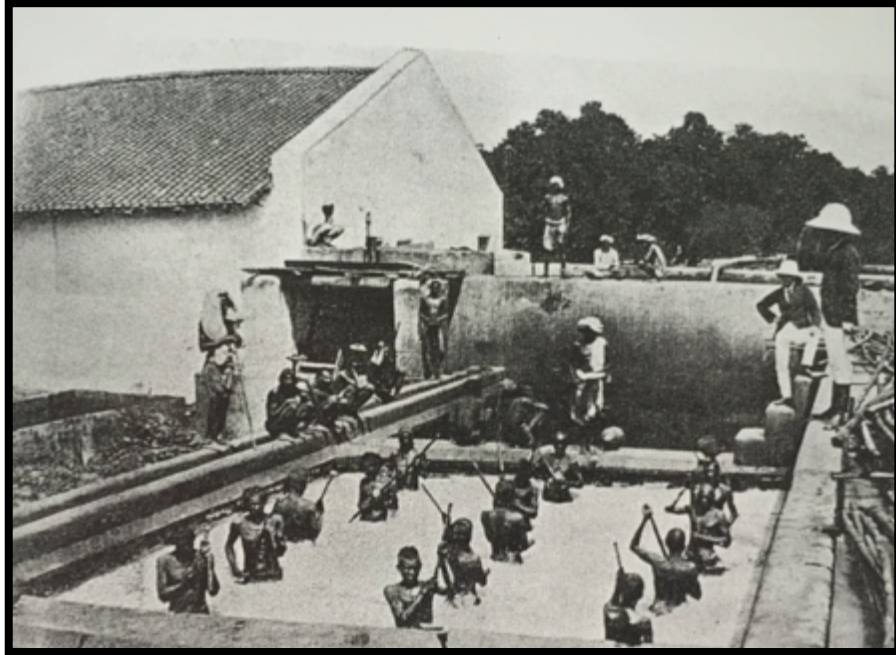


Figure 30: Workers in a vat of indigo  
(Balfour-Paul 1998, 111; Delamare and Guineau 2000, 94-5)

After this process was completed, the sludge was collected, boiled, and filtered in a third container. Then the mixture was poured into moulds to create the indigo cakes, which were stamped with the date and factory name, and stored in a drying house to prevent cracking (Balfour-Paul 1998, 110; Cardon 2007, 343). From here the indigo was shipped to the same location as the silk, where it was turned into a deep shade of purple velvet.

Once the fibres are dyed with indigo, the colour is set. Like most dyes, both natural and synthetic, indigo needs to be processed before it can be a useful dye. Because indigo was being shipped around the globe, the leaves needed to be transportable, most often as a hard cake, making the indigo last “indefinitely” (Cardon 2007, 343).

Indigo was an important dye in the 19<sup>th</sup> century because of its depth of colour and light-fastness, as it was a durable dye like no other. The strength and robust quality was something people compared with the new synthetic dyes as the first products rolled into the fabric markets. It



was this durable quality of indigo and other natural dyes that the synthetic dyes could not achieve, and the reason natural and synthetic dyes were both applied to fabrics (Casselman 2008, 21).

### Coal Tar Dyes or Basic Dyes

“It is difficult to imagine, from a mere examination of a piece of coal, that such an apparently simple substance can in reality have the complex constitution which chemical science has proved it to possess. It is only when it is remembered that coal is formed by the natural decay and compression of organic vegetable matter that its potentialities can be realized, its four chief constituents, namely, carbon, hydrogen, nitrogen, and oxygen, being capable of forming an almost infinite variety of compounds (Ramsey 1917, 13).”

Basic Violet 1 and 14 and Basic Green 4 are coal tar based dyes. In comparison to the other raw goods used in Garment A, B, and C (Brazilwood, indigo and silk and wool), the coal tar dye world was still very young but nonetheless complex, with new developments burgeoning every year. The chemical industry in Europe from 1856 onwards was moving at an incredible rate.

However, we have to go back to 1681, when the first patent was given for the “destructive distillation of coal” and to 1792, when coal was manufactured into coal gas. Just over one hundred years later, further distillation was performed to make naphtha, an ingredient often used in making coal-tar dyes (Ramsey 1917, 13-14). Aniline was first discovered in 1826 in indigo, and in 1834 in coal tar (Ramsey 1917, 37). These discoveries, in addition to Michael Faraday’s discovery of benzene from compressed oil gas in 1825, were important components in creating aniline dyes (Dronsfield and Edmonds 2001, 25-26).

Since 1813 coal gas lighting has been used to light the city streets of London, England. This practice soon became commonplace around Europe and in North America. Coal tar was the waste product produced by creating coal gas and coke. By the mid-nineteenth century, chemists were looking for a way to make use of this black tar-like substance (Ramsey 1917, 13). From 20,000

pounds of coal, 1,000 pounds of coal tar is produced, from which one can obtain seven pounds of benzene, six pounds of naphthalene, and three pounds of phenol, all of which can be used in the production of synthetic dyes (nearly 200 different kinds). For Basic Violet 1 and 14 and Basic Green 4, aniline is used, by further refining benzene into nitrobenzene (Dronsfield and Edmonds 2001, 26, 27, 31 and 37). Basic Violet 1 and 14 and Basic Green 4 are all from the same chemical family; their chemical structures are very similar (Figure 31) (Dronsfield and Edmonds 2001, 115). Pure anilines generate purple (Gardner 1915, 161).

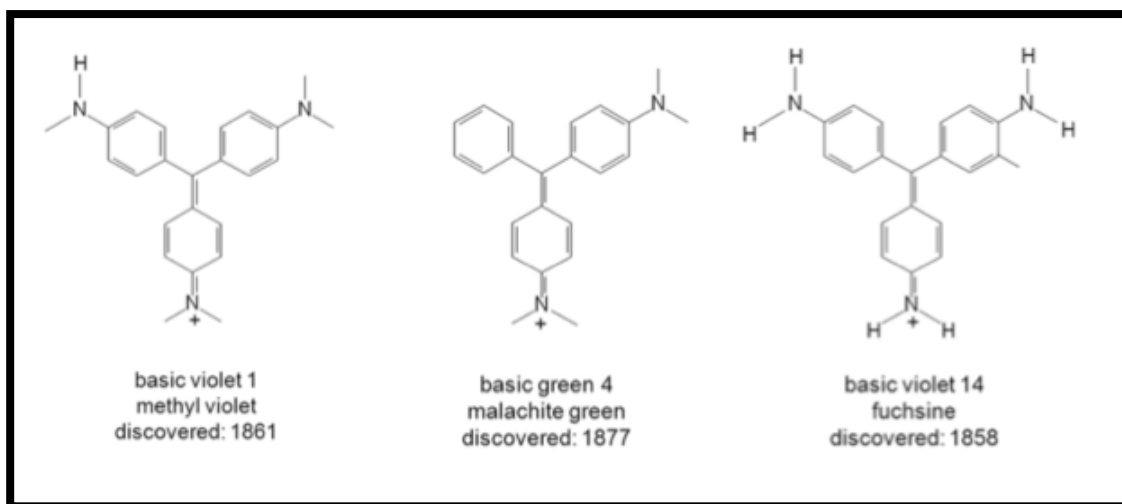


Figure 31: Chemical structures for Basic Green 4, Basic Violet 1, and Basic Violet 14  
Notice the similarities in the chemical structures  
(Poulin and Duguay 2013, 3 and 4)

The manufacture of these dyes requires heat. All of these dyes have different boiling points, depending on the quality of the dyes and the products used in their manufacturing. Dyers discovered it could change the final colour produced (Dronsfield and Edmonds 2001, 79). Basic Violet 14, for instance, if heated above a certain temperature, could become blue instead of magenta (Dronsfield and Edmonds 2001, 81). Not all dyes were created equal; the dyes from Germany had a reputation for being purer than the ones produced in France (Gardner 1915, 156).

Dyers and colourists of fibres and fabrics would know this and adjust their recipes accordingly. They could even have intentionally bought these dyestuffs knowing that they did not create the original colour that was marketed.

### **Basic Violet 14 or Fuchsine: France (1860s) and Germany (1900)**

Basic Violet 14, found in both Garments A and C, is also known by several other names: Aniline Red, Fuchsine (after the fuchsia flower), Rosaniline, and Magenta (Gardner 1915, 159; Travis 1993 67). It is a bright red colour with a hint of blue (Dronsfield and Edmonds 2001 81). François Emmanuel Verguin discovered the original patent in 1858, at the Louis Rafford's Factory near Lyon, France (Travis 1993, 61 and 67). It is unclear if Verguin achieved the Fuchsine dye through scientific understanding or experimenting with aniline and the other compounds he found in the factory. By May 1859, Fuchsine was in production and it was an immediate success, both financially and fashionably, soon knocking mauveine off its pedestal because it was easier and more cost effective to produce (Gardner 1915, 156; Travis 1993, 68). Creating a specific colour of dye can be created using different ingredients, and soon other versions of Fuchsine could be found on the market (Dronsfield and Edmonds 2001, 78; Travis 1993, 68). This led to patent litigations in both France and Britain. One of the "improvements" to Fuchsine manufacture was the use of arsenic acid because it was easier to produce. This method was used until the 1870s when the by-products of this and other chemicals polluted the river in Lyons, causing the deaths of the local population. The factory was forced to shut its doors as a result. The factory closure and the outcome of the "patent wars" changed the geographical face of the dye world, shifting the concentration of production to Germany and Switzerland (Travis 1993, 137).

### **Basic Violet 1 or Methyl Violet: Germany or France**

The other aniline dye discovered in both Garment A and B was Basic Violet 1, which was also known by the names Methyl Violet, Violet de Paris or Gentian Violet. In 1861, Charles Lauth, a prominent chemist in France, invented the original formula. Lauth began by experimenting with Hofmann's Violet and applying methyl iodide on aniline (Ramsey 1917, 209). This recipe was too costly for mass production, so M. Brady, a chemist at Poirrer and Chapat, dye manufacturers in St. Denis, France, later performed experiments to find a more cost-effective solution (Travis 1993, 97.) Methyl Violet was produced in France until 1879 (Hasan 21). In 1883, further improvements were made in Germany by Alfred Kern and Heinrich Caro, both scientists at two prominent dye companies: Basel at Bindschedler and Badische Anilin- und- Soda-Fabrik (BASF) in Mannheim, Germany respectively (Hasan 21). Methyl Violet displaced Hofmann's Violet because it was made directly from the source, thus proving to be more economical (Gardner 1915, 231). Methyl Violet (like Malachite Green) also uses dimethylaniline, in addition to cupric nitrate, sodium chloride, acetic acid, cuprous chloride, and sand (Gardner 1915, 62; Ramsey 1917, 114-5).

### **Malachite Green or Basic Green 4: Germany**

The last synthetic dye used to dye Garments B and C was Malachite Green or Basic Green 4. It was also known as Victoria Green, Aniline Green, Diamond Green or Benzaldehyde Green (Arora 2009, 179; Gardner 1915, 85). In March 1877, Emil and Otto Fischer for BASF (Travis 1993, 85-6) and Döbner (location unknown) independently discovered Malachite Green (Gardner 1915, 85). It became a much-used dye in Great Britain (Gardner 1915, 230; Travis 1993, 296). Some chemicals required to make the Malachite Green include: benzaldehyde, dimethylaniline, anhydrousinc

chloride, hydrochloride acid, lead peroxide, sodium sulphate and carbinol. The process was truly complex, with the distilling, dissolving, oxidizing, heating and mixing of these and other chemicals (Ramsey 1917, 113). Yet the process was pursued in all its complexities because Malachite Green was an improvement over the existing green dyes, mainly due to its improved colourfastness and absence of toxic arsenic, which had been a staple in green colourings (Matthews David 2015, 76-98). Methyl Green and Iodine Green, were the principal synthetic alternatives for this green dye, tended to become violet if used at a high heat (Travis 1993, 296). The choice for green as a means to create purple fabric is an odd one. If one looks at the outcome of mixing these colours with paint rather than dye, the result is a muddy brown. Looking at the molecular structure of both Malachite Green and Methyl Violet, they are in fact quite similar (See Figure 26).<sup>15</sup> Could it be that Malachite Green had the potential to also be a fugitive dye and become purple or violet when exposed to a particular temperature? If so, would it have been used for this reason, rather than for its green colour? This is an aspect that is worth further investigation, which I am not able to explore at this time.

It is not certain where the Basic Green 4 and Basic Violet 1 used to make Garment B were manufactured, but there were companies producing dyes in Switzerland, France and Britain. Some of the factories in Europe and America were set up by larger parent companies from Germany, another means of avoiding tariffs and patent fees. What is known is that there were no factories set up in Canada that manufactured synthetic dyes. The evidence of this can be seen in the advertisements in contemporary Canadian trade journals representing dye manufacturers and

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<sup>15</sup> Part of my travels included a visit to the Chemistry and Biology Department at Ryerson. Here I met with Shawn McFadden, Instructor and Technical Specialist, for the department. In our meeting, he helped clarify the results and explain the machinery used to detect the dyes and chemicals used in the three artifacts. Shawn pointed out the similarities between the dye molecules, also adding that Malachite green could turn purple because of this. Fortunately I was also able to find this to be true in my research.

wholesalers from Britain, France, Switzerland, and Germany (*Canadian Manufacturer and the Industrial World* January 7 1887, 30; *Canadian Pharmaceutical Journal* 1871, 151). The Canadian manufacturers of silk, wool, and cotton goods would have been interested in these dye products.



Figure 32: The History of Bayer- Box of Malachite Green Dye  
Note the lettering, this box was intended for an Asian Market  
(Verg 1988, 52)

The reason is clearer now why both natural and synthetic dyes were used to dye fabrics in the nineteenth century. Indigo was known for its durability and light-fastness, and while it can produce beautiful shades of colour; these colours are nothing in comparison to the brilliant shades produced by synthetic dyes (Hasan 15). Reading about modern examinations of basic dyes, they were most often used to colour leather. In addition, the basic dyes appear to work better on leather (a protein based material, like silk) that was treated first with a vegetable tan. “Basic dyes are also preferred to dye leather because they can get combined easily with vegetable-tanned leather thus doing away with mordant” (Hasan 36). Just like the dyes found in Garments A, B and C,

the basic dyes are used with plant-based dyes. This also proves Casselman's assertion: that natural and synthetic dyes do not exist in an 'either-or' scenario. They are not mutually exclusive technologies. Ironically, similar qualitative attributes [e.g. cost, fastness] can be applied interchangeably to both natural and synthetic dyes (Casselman 2008, 21). As we can see, the colour for all three garments is still strong. There is some fading and colour change with Garment A (along the skirt where trim may have been) and Garment C with the pink portions along the back of the bodice), but nearly none with Garment B – over one hundred years later the velvet's purple remains quite true.

### Silk through Asia, Europe, and Canada

“A strange process too, this, by which experience is converted into thought, as a mulberry leaf is converted into silk. The manufacture goes forward at all hours.”

-Ralph Waldo Emerson, 1837 (Field, Senechal and Shaw 2007, 8)

It would be remiss to discuss dyes without mentioning the items they are supposed to colour: silk. All three garments were made of silk. Silk is the most luxurious fabric in the world. No other fibre, either synthetic or natural can compare to its lustre, strength, and affinity to dyes. It is the fibre that in the nineteenth century was in high demand by consumers who wanted fashionable garments in the latest colours.

Countries all around the globe made attempts at producing silk fabrics, and Canada was no exception. The majority of silk comes from the cocoons spun by the domesticated *Bombyx Mori* silkworm. These silkworms (the caterpillars or larvae) grow in warm climates and thrive on a diet mostly of mulberry leaves. The cocoons are soaked, unravelled, treated and eventually spun into silk threads. Some of these silkworms transforming inside their cocoons are left to grow into adult

moths to continue the cycle of silk production. Opened cocoons are used to create silk fibres (Chandler 2006, 21; Schoeser 2007, 60-65).

There are two aspects to the production of silk fabric. The first is cultivation of the silkworms and production of cocoons. The second part is taking these cocoons and turning them silk cloth. America and Britain both attempted to raise silkworms as part of their silk manufacture industries, but they found that their climates and economies could not sustain growth (Bush 2000, 4; Field, Senechal and Shaw 2007, 15-29). During the 1880s the trend became for silkworms to be raised in China, Japan, Italy and Australia; places with warmer climates. The cocoons were then shipped to other countries to be turned into threads or woven into fabrics (*Canadian Manufacturers of the Industrial World* Feb 3 1882, 37; *Dominion Dry Goods* May 1884, 171). In 1887 Canada began shipping live silk cocoons from Vancouver to Montreal, New York, Massachusetts, and Connecticut (Chandler 2006, 19-21; *Monetary Times and Insurance Chronicle Trade Review Chronicle* July 21 1882, 64). Because of the delicate and expensive nature of transporting these cocoons (by the turn of the century one shipment – 539 tons- was worth 1.5 million dollars), shorter train cars were built so the train could travel at faster speeds and still successfully make all the bends and turns of the route (Chandler 2006, 20). Priority was given to the silk trains over all others. Even royal trains made way and yielded to the silk trains (Chandler 2006, 19-21).<sup>16</sup>

Once the cocoons reached the factory the second part of silk production began. Manufacture included: cleaning, unwinding, and degumming of the cocoon filaments (also known as raw silk), bleaching (because the raw silk can be white, pale pink, green or yellow), spinning the raw silk into thread, adding mordants (if needed), and then dyeing (Field, Senechal and Shaw 2007, 53). The silk

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<sup>16</sup> The silk train service was a critical means of silk cocoon shipment in North America until the completion of the Panama Canal in 1931 (Chandler 2006, 21).



threads are then woven into the desired type of fabric – in the case of Garment B plain satin or velvet. This is the point at which Basic Green 4, Basic Violet 1, and indigo became one with the silk fibres. It could have been that all three dyes were used separately, or that the natural dye was in one bath and the synthetics in another, or that all three were used simultaneously. The silk threads would have most likely been dyed at the silk factory, but there were companies that specialized in dyeing goods on large scale for this purpose (*The Canadian Manufacturer and the Industrial World* June 7 1889, 366).

It is not clear where the silk from the three garments came from. For Garment A, manufacture would most likely have been in Europe: either the United Kingdom or France, and then transported to Canada. The United States had made several attempts to produce silk textiles, but it was not until the 1880s that they became successful (Field, Senechal, and Shaw 2007, 107-114). As for Garments B and C, by the 1880s there were several American-owned mills located in Montreal, they included: the Corticelli Silk Company, Belding, Paul and Company, and the British America Company. The Canadian-owned silk factories: the Corriveau Silk Company and the Canada Silk Company. These companies shipped in raw silk and processed the goods into silk threads. Some of these threads were sold as sewing thread on spools or woven into ribbons or fabric. The silk items these companies produced comprised of sewing silk, and broadcloth, but there is no mention of silk velvet being manufactured in Canada (*Dominion Dry Goods* May 1884, 181 and 189; *Canada Under the National Policy 1883; Monetary Times and Insurance Chronicle Trade Review Chronicle* April 7 1880 138-91). Who did the dyeing? Did these companies dye the goods themselves or did they use the services of the British American Dyeing Company or any other dye house? (*Canadian Manufacturer of the Industrial World*, June 3, 1887, 356)

The Canadian companies produced quality goods, but there appears to have been some reluctance on the part of the nineteenth-century Canadian consumer to purchase Canadian silk, preferring the British and French labelled textiles. There was a push for Canadian silk companies to stamp their textiles with their own moniker to prove they were of significant value, rather than applying the labels of other countries (many companies did this around the world, including those from America) (*Canadian Dry Goods Review*, June 1893, 6).

Velvet, while it is also made of silk, requires a different means of weaving because of its pile or nap. There seems to be no evidence that any silk velvet was made in Canada because of the specialized machinery and skill required to manufacture it (*Monetary Times and Insurance Chronicle Trade Review Chronicle* November April 7 1882, 1240 and November 14 1884, 547).

It is possible, however, for the lavender silk and the sewing thread of Garment B to have been produced in Canada, but despite Canada having its own silk produced domestically, Canada was still importing silk, including silk velvets, from Great Britain, United States, France, Germany and Japan (*Canadian Journal of Fabrics* March 1894, 88; *Canadian Journal of Commerce, Finance and Insurance Review* April 9 1886, 893, 895). It is just as likely that both the lavender silk and the purple silk velvet came from Europe. In addition to the trade magazine reports, advertisements from A. Murray and Co. also indicate that their goods were from France and Great Britain.

For Garment C, there is a greater chance that the fabric was spun, woven, dyed, and printed in Montreal. By the turn of the century factories there were well established for dyeing and for silk fabric manufacture. The fabric may have also come from the United States, Europe or Asia. An increasing number of finished textiles, rather than the silk cocoons, were coming directly from Japan and China (*Canadian Journal of Fabrics* March 1894, 79).

Dye analysis provides an opportunity for researchers to look at textiles with even more detail. One can only make assumptions as to which dyes and mordants were used and where or who contributed to the colouring of the fibres. I had a strong inkling that both natural and synthetic dyes were used for all three garments. The analysis not only proved this but also was able to show overlapping ingredients - the brazilwood, Basic Violet 1 and 14 and Basic Green 4, with indigo being the only dye used once. From here we were able to go on a journey around the globe tracking the possible origins of each, going as far east as Bengal, India and as far south as the coast of Brazil, to the dye centres of Europe: Germany, Switzerland, France and Britain. We also took a glimpse into where silk in the last half of the nineteenth century was produced and processed, looking at places like China and Japan as possible sources of silk and Britain, France, United States and Canada as potential locations for manufacturing. Our final stop on this passage ends with the purple velvet for Garment B arriving in Hamilton, Ontario.

### Chapter Three: An Intimate Look at Clara and Her Purple Dress

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Of the three garments chosen and tested for this thesis, Garment B had the most information allowing me to dig deeper into the colour purple and its place in the social context of late 19<sup>th</sup>-century southern Ontario. In this chapter, we continue to follow the fabric once it reaches the dry goods store, A. Murray and Co., and becomes a garment. We delve into further detail beyond the dress's (supposed) original purpose, Clara and Eli's wedding, and look into other possible occasions on which it could have been worn. This provides an opportunity to discover life in a bustling city in late 19<sup>th</sup>-century southern Ontario. Garment B's journey is traced right up until it was donated to Black Creek Pioneer Village in 1971.

Before Garment B was built and placed into Clara's care, the garment's components travelled great distances. Many hands were necessary in order to produce and ship the fabrics to Hamilton. The indigo was picked, processed by hands (and whole bodies) and packed for shipping. There were the hands of the dye manufacturers and their team, who packaged and loaded the shipping crates. Silk cocoons were raised and fed, then placed into bales. All of these materials were loaded onto horse-drawn vehicles that brought them to train stations and/or ports, where they were loaded onto ships bound for Europe or North America. Once they had reached the new shore, they were transported again, to the factory where these raw materials were all combined to make the velvet and silk for Garment B. Some mills, like the Belding, Paul and Company and the British American Company in Montreal, had all their silks dyed at the factory, like the fabrics of both Garments A and B, while other companies sent them to be dyed once the fabric was woven, like Garment C (*Canadian Journal of Fabrics* August 1894, 244-5).

Once the desired colour was achieved, it was then woven and rolled onto bolts. Many different people were necessary for the dye and weaving process. Once the bolt was ready, it was loaded and then shipped to Hamilton, via the St. Lawrence or by the Grand Trunk Railway or the Hamilton Central Railway Co (Location 1 on Hamilton Map Figure: 33) (*Canadian Journal of Commerce Finance and Insurance Review* August 1886, 361). The fabric travelled by ship or train or even both, depending on where it was coming from, to be received in Hamilton's train station or shipping ports. More hands removed the fabric and it travelled its last leg, most likely by horse and cart, until it reached 18 King St East, where it was unloaded and shelved ready for customers to buy and for women like Clara Bell Waddell to have made into garments.

I begin by investigating the name A. Murray and Co. on the waist tape of Bodice 1 and the names and dates in the accession file - Claribel Waddell and Eli Van Allen and the day of their wedding, June 8, 1887 (Marcus 1995, 108-112). There is a stark contrast between the global journey the raw materials took and the short distance the garment took after arriving in Hamilton, Ontario. From the arrival of the purple silk velvet either by train or by ship to Hamilton, it was then transported to A. Murray and Co., a dry goods store, opened by Alexander Murray in 1853 at 18 King Street East, at Gore Park in Central Hamilton. The store sold fabric, trims, notions undergarments, hosiery, shawls, parasols, and accessories. By 1887 Alexander Murray and his partners William Murray and William London expanded the store to include 20 and 22 King Street . In order for the garment to be constructed, Clara would have been measured for an accurate fit, most likely by a dressmaker who worked at the store (Light and Parr 1983, 90-1; Mida and Kim 134-137). Then the dressmaker(s) and any other stitchers would have cut and sewn the purple velvet and the lilac silk (Light and Parr 1983, 90-1). Once the garment was complete, Clara would have

brought it to her parent's home at 22 John Street South and when the day came, worn it on her wedding day at the Wesleyan Centenary Methodist Church at 24 Main Street (Registrations of Marriages, MS932; Reel: 59).

In the theatre we design and build costumes to fit a character that exists in a script. Here I found myself using similar methods, but working backwards: finding a garment and imagining the character that once embodied the garment (McClung Fleming 1974, 156-7; Prown 1982, 7-9). Unlike today's tradition of purchasing a single-use wedding gown, Victorian Canadian women would wear their dress on other occasions. In fact, the dress may not have been made for the wedding at all. The other details of Garment B also offered insight into Clara's life. The less glamorous aspects like the dress shield and the sweat stains meant the garment was worn more than once. The dress-shields were an effort to protect garments from perspiration, helping to preserve the expensive articles of clothing. Questions arose from these features, questions that made me take a step further into what the interests and activities of a young, newly married woman in southern Ontario were. Why would Clara choose the colour purple? What did the choice of fabric and design say about the wearer?

Without speaking to Clara directly there is no way of truly knowing these reasons. However, I propose some scenarios that would have influenced her decision to wear purple. By looking at death registries for Clara's father and brother, it appeared they both died the same year as she was married.<sup>18</sup> Victorians maintained lengthy and strict observances of mourning for close relatives. Mourning clothes were a key part of this regimen. Only specific colours could be worn at specific

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<sup>18</sup> There is some conflict with the dates in the registry and the dates on the headstone. Further inquiry is needed here.

times; this included particular shades of purple (Taylor 1983, 214-17, 131-2; Bradbury 2011, 209, 2011, 234).

Aside from mourning traditions, the colour purple may have also been chosen because of the influence of another burgeoning area of technology: photography. The custom of taking photographs on special occasions was becoming increasingly popular. It appears that certain colours looked different when photographed. Purple was one of the shades that fell in this category and may be another reason Clara could have chosen the combination of purple velvet and lilac silk fabric for Garment B (Anthony's Photographic Bulletin 1882; Lea 1868 154).

In addition to mourning practices and photography as reasons for Clara choosing the colour purple, one cannot forget personal preference as an option. It may have been a favourite colour, or one that reminded her of a special event or person. Sales staff and the popular colours of the day may have also influenced her choices. Sources such as *The Canadian Dry Goods Review* kept shopkeepers and dressmakers apprised of the latest trends in the cuts, fabrics, and colours.

It is very likely that Garment B was worn on more than one occasion. I was able to find other events that Clara could have attended wearing either Bodice 1 or 2, the skirt, and the train, such as baptisms, other weddings, and social gatherings held in their home. By 1891 their daughter, Mary Alma, was born. Clara may have worn Garment B at her daughter's christening. More extravagant occasions included the annual Christmas ball held at the Masonic Strict Observance Lodge and the opening of the Hamilton Public Library. The latter had all the members of city council and the Earl of Aberdeen and his wife in attendance (Henley 1989, 74-5, 36-38; Bailey 1981, 177).

At some point Garment B ceased to be a useful and fashionable garment. The 1880s silhouette of the bodice, sleeves, and skirt were no longer in fashion by the mid-1890s. The skirt

and Bodice 2 have also been taken apart, which means that this garment had life beyond its original intended use. The wear and the alterations made to Garment B tell us more about the life of the garment, including the potential for having more than one wearer. Sometimes garments were taken apart to make clothing for another person, or added to a quilt. Following the garment meant searching for events and locations in Clara's life where the garment may have moved. One such occasion was The Encampment, a fundraiser held by the Wentworth Historical Society Ladies Committee, in November 1895. Both Clara and her mother were members. Here the female participants created re-enactments of different historical scenes, dressed up in different costumes. While it is an extreme possibility, the dress may have been deconstructed to become part of this event (Committee, 1895; [www.virtualmuseum.ca](http://www.virtualmuseum.ca) )

In 1910 Eli Van Allen passed away suddenly, and Clara and Alma remained at 163 Main Street in Hamilton (Canada Census 1911). On November 7 1912 Alma married Luther Holton, and the couple resided with Clara until 1920 when they purchased Edgecliff place, at 133 Edgecliff Street in Nelson Township (now Burlington) (Registrations of Marriages Series: MS932; Reel: 235; <http://images.burlington.halinet.on.ca/2394773/data?n=8>). Census records indicate Clara continued to live with her daughter's family, just as her mother had done with her. She did so until her death on November 16, 1921 (Death Registries, Series: MS935; Reel: 284). I propose that Garment B travelled with Clara to this address. In 1936 Luther died suddenly after succumbing to gunshot wounds to his face, when his rifle accidentally backfired. Alma and their five children remained at the estate until 1944 when Edgecliff Place was sold. Alma and her son John moved to Toronto to 184 Heath Street, presumably taking Garment B with her. Alma's obituary listed her



funeral at this address on June 4, 1970. This is presumably the last place prior to Garment B's donation to BCPV, 6 months later in 1971.

Below is a map of the known and possible locations of Garment B, followed by a map legend.



Figure 33: Closer View of the journey for Clara Van Allen and Garment B (A. Gilbert)

Numbers indicate locations known for Garment B to have travelled  
Letters indicate other locations/events mentioned in this chapter

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## The Fabric Becomes a Garment: Central Hamilton

“We rather take the ground that Hamilton, has for many years been of steady growth, with no over-speculation, less failures, and less depreciation than any city in America; and its affairs to-day are on the most solid basis, with the most complete water works and sewer systems, both gas and electric lighting and an excellent electric railway to all parts of this town; and by both rail and water has direct communication and traffic with all parts of the world (Rich 1892, 14)”

Hamilton was founded at the beginning of the nineteenth century as a port on the Great Lakes shipping route and had become a manufacturing town by the time Clara bought her silk cloth in 1887. By 1875 the Grand Trunk Railway and the Canadian Pacific Railway were bringing in and exporting raw goods and finished goods (Rich 1892, 56 and 57). This presence of manufacturing, along with the lack of military, made Hamilton quite different than other Ontario cities similar in size, such as Kingston. So prevalent was production in this city that it was proudly known as the “Birmingham of Canada” (1892 18).<sup>18</sup> Most of the journey of Garment B occurs in central Hamilton or Barton until 1912.<sup>19</sup> This is evident by looking at the addresses of the people and places in this narrative: the store A. Murray and Co. at 18-22 King St. East (location 2 on map of Hamilton); Clara Waddell and her family’s home at 122 John St. North (location 3 on map of Hamilton); the Centenary Methodist church on Main St. where Clara and Eli’s wedding took place (location 4 on Map of Hamilton); Eli Van Allen’s home at 5 Main St. (location 5 on Map of Hamilton 1887). The Van Allens relocated once more by 1897 to 163 Main Street South (location 6 on the Map of Hamilton) (Hamilton City Directory 1897).

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<sup>18</sup> This is a comparison to the city of Birmingham, England, which was the hub of innovation and manufacture during the industrial revolution.

<sup>19</sup> This area was known as Barton during this time. Hamilton was called Barton before the city grew (McCullough 1989, 160).

The creation of Garment B began at A. Murray & Co., a dry goods store that Alexander Murray opened in 1853 at 18 King St East. It was located in an area called Gore Park or “the Gore” that was key to Hamilton life.<sup>20</sup> This area was an important centre of business and was home to other dry goods stores, a sewing machine factory, a hardware store, a photography studio, a bank, a department store, a post office, a garment factory, the Connaught Hotel and the Wesleyan School for Ladies.<sup>21</sup> All these surrounded a triangular-shaped park with a large fountain and memorial statues. This is where Hamiltonians enjoyed parades and important gatherings, such as visits by important politicians and royals. A. Murray and Co. was located across from the iron fountain (<http://hpl.ca/articles/buildings-gore>).

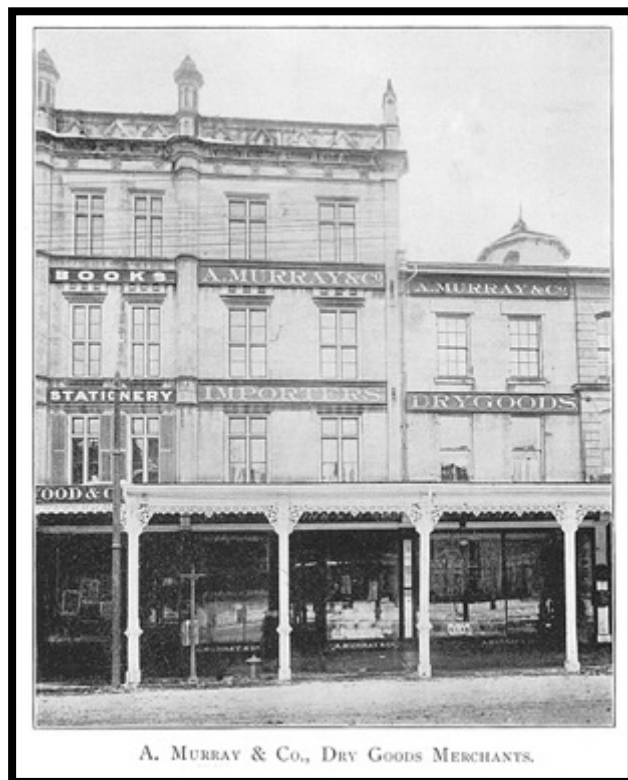


Figure 34: A. Murray and Co. with signage and awning 1893

[http://www.torontopubliclibrary.ca/detail.jsp?Entt=RDMD-SOUV\\_PIC-R-923&R=DC-SOUV\\_PIC-R-923](http://www.torontopubliclibrary.ca/detail.jsp?Entt=RDMD-SOUV_PIC-R-923&R=DC-SOUV_PIC-R-923)

<sup>20</sup> It is not known why this area is called the Gore. Some speculate it is the shape of a gore - a fashion term for a triangular piece of fabric inserted at the base of a garment (McCullough 1989, 160).

<sup>21</sup> This school was one of the first to grant degrees to women in Canada. With the connection of Clara’s church and this school I was curious to see if Clara had been a student here. I researched the graduation ceremony pamphlets from the years 1877-1887, but her name did not appear.



Figure 35: 18 and 20 King Street East, Hamilton, now demolished.  
22 King Street East now a remodelled building, and is now a bank.  
(A. Gilbert)

Alexander Murray was the founder and owner of A. Murray and Co. He emigrated from Kinoull Hill, Perthshire, Scotland in 1848 at the age of 23, part of the surge of Scottish immigrants to Upper Canada in the mid 1800s. By 1850, he married Mary Fraser and together they had four sons and two daughters. Later his son James worked as a clerk, and then continued operating A. Murray and Co. until 1922, long after his father's retirement and then death in 1908 (Bailey 1981, 118-9). In the 1861 census reports, Alexander Murray was listed as a draper, a person who sold textiles (Canada Census For 1861, Roll: C-1086). In the next census report in 1871, Alexander Murray was listed as a merchant (Canada Census for 1871, Roll: C-9926; Page: 38; Family No: 143). This suggests that the range of goods he sold became quite extensive, beyond just textiles to



include notions, accessories, and dressmakers' services in pre-confederate Canada. By 1867, the business expanded to 20 King Street East. In 1870 A. Murray and Co. experienced further growth when Alexander partnered with William Murray, and William London (Bailey 1981, 118-9).

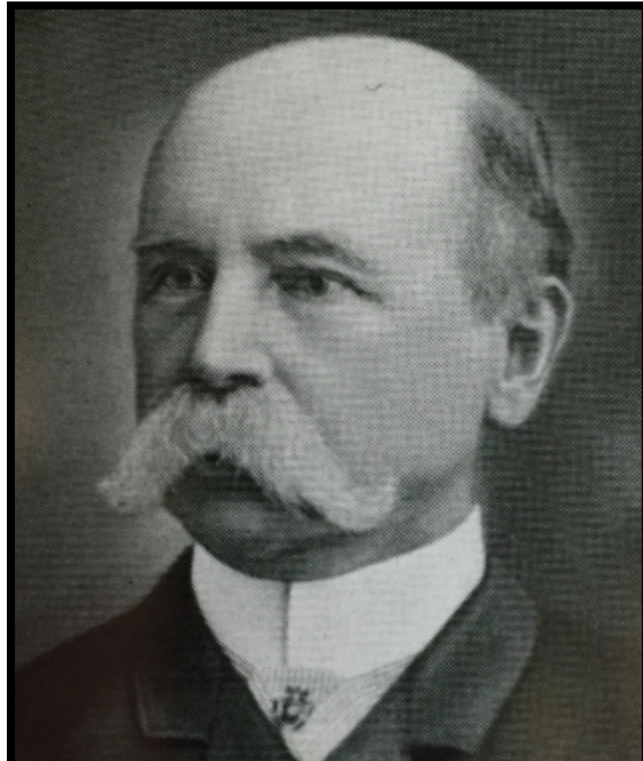


Figure 36: Alexander Murray  
Founder and owner of A. Murray and Co.  
(Bailey 1981)

William Murray, no relation to Alexander Murray, was born on May 25, 1834 and was raised on the Breadalbane Estate, also in Perthshire Scotland. William Murray immigrated to Toronto, Ontario in 1854 where he established himself as a businessman. Unlike Alexander he never married, but was able to bring his siblings, one brother and two sisters, over from Scotland. Together they bought a large estate in Hamilton, 377 Ness Avenue (Archives of Ontario; Toronto,

Ontario, Canada; Series: MS935; Reel: 308). William was listed as an accountant in the Hamilton Directory of 1887; however, he was also a noted poet in Hamilton and Scotland (Bailey 1981, 118-9; <http://towerpoetry.ca/poetryplus/talk-bard.html>). William died on May 26<sup>th</sup>, 1923 in Hamilton at the age of 89 (Death Registry, Series: MS935; Reel: 308).

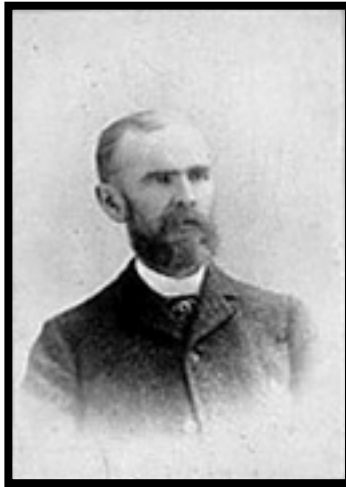


Figure 37: William Murray  
(Whitehern archives, <http://towerpoetry.ca/poetryplus/talk-bard.html>)

As for William London, the third partner, no information could be found, either in newspapers, the Dictionary of Hamilton Biographies, or in census reports.

The dry goods business of the three partners clearly thrived. By 1885, the business increased in size again to include number 22 King Street East. The advertisements dating from 1885 to 1887 found in the *Hamilton Spectator* and the *Portfolio* (the journal for the ladies attending the Wesleyan Female College) refer to items that the business was selling: wholesale and retail woollens, silk brocades, colored silks [sic] and velvets, along with trims, gloves, and mantles from the United States and Europe (both France and Great Britain). It is uncertain how the fabrics were ordered, whether through a wholesale agent or directly from the textile company. Dry goods

merchants were able to keep up to date on the latest fabric and fashion trends in Europe, the United States and other parts of Canada, by using periodicals such as *The Canadian Dry Goods Review*, *The Dominion Dry Goods Report*, *Canadian Manufacturer and Industrial World*, and *The Canadian Journal of Fabrics*.

**A. MURRAY & CO.**  
**Black and Colored Silks**  
 A SPECIAL LOT. EVERY LADY SHOULD SEE THEM.

All-Silk Check Surahs at 60c. per yard, worth 75c.,	Heavy Black Gros Grains at 90c. per yard, worth \$1.13,
Heavy Colored Gros Grains at 85c. per yard, worth \$1,	Extra Quality Black Gros Grains at \$1.10 per yard, worth \$1.25,
Heavy Colored Satin Duchesses at \$1 per yard, worth \$1.25	Black Brocades, grand goods, at \$1.40 per yard, worth \$2.

*This is a rare chance to secure Pure French Silks at less than importers' prices. Call and see them.*

**A. MURRAY & CO., 18, 20 AND 22 KING ST. EAST**

Figure 38: Advertisement for A. Murray and Co.  
 (The Hamilton Daily Spector Saturday May 7, 1885)

clothes for plain and Combination Costumes.  
**McILWRAITH & McMASTER**  
**A. MURRAY & CO.**  
**Tremendous Bargains in All-wool French Dress Goods**

Beautiful DeSeiges at 12 1/2c. per yard.	New Anglier Cloths at 40c. per yard.
All-wool Camels' Hair Cloth at 20c. per yard.	All-wool Cashmires, 45 inches wide, at 50c. per yard.
All-wool Batemine Serges at 20c. per yard.	All-wool Alabastro Cloths, 45 inches wide, in Cream, Blue, Fawn,
All-wool Batemine Serges at 25c. per yard.	Tan and Black.
All-wool French Cashmires at 30c. per yard.	Thirty-six inch Cream Nun's Veiling at 20c. per yard.
All-wool Ottoman Cloths at 35c. per yard.	Nun's Veiling in Cream, Pink, Blue and Black at 25c. per yard.

Just received from Paris the new New Turkish Robe (Turkish Capes, New Brocades for Garmenting, etc. Beautiful New Prints just to hand—lawn colored grounds with fancy figures. Call and examine our magnificent stock in every department. The goods are all first-class, and at prices to satisfy all.

**A. MURRAY & CO., 18, 20 AND 22 KING ST. EAST**

Figure 39: Advertisement for A. Murray and Co.  
 (Hamilton Daily Spector Saturday May 9, 1886)



Other advertisements also show that in addition to supplying goods, one could have garments, mantles, and hats made, with dressmaking and milliners available to construct these items (*The Portfolio* February 1895, 3). This was not a service that every dry goods store provided. Many dressmakers set up a shop in their home, rather than working for a company (Light and Parr 1983, 30-31). In the December 1895 edition (page 6) of *The Canadian Dry Goods Review* an article discusses the profitability of running such a department. It was one of the means by which dry goods stores could compete with department stores. The *Canadian Dry Goods Review* also geared many of its articles and advertisements to owners, drapers, and dressmakers allowing them to keep up-to-date on the latest fashions, both in fabrics and colours, cuts and designs. One such advertisement geared to dressmakers presents stamped dress belting (or waist tape), offering to have the name of the dressmaker on the label (*The Canadian Dry Goods Review* March 1896, 49). The label inside Garment B is the name of the store, implying that the garment was constructed at 18-22 King Street East. Alternatively, some portions of the garment might have been built in the store, while independent dressmakers off-site completed other sections. This would have been a way to complete items if orders at A. Murray and Co. were backlogged. Dressmakers and those working in the needle trades were predominantly women, but men did sew garments. A slightly higher number of men sewed the custom-made garments than in the ready-made garment industry (Light and Parr 1983, 31).

The dressmaker's duties included measuring the customer, which could have taken place at the store or at the customer's home. Commercial patterns were not available in 1887 so many dressmakers had a number of their own patterns that they adapted to fit the customer as the need

arose. Because many garments were made to order, many customers had their own patterns that had been created from previous orders (Light and Parr 1983, 91).

From here the fabric that the customer had purchased was cut, sewn, pressed, and decorated. Assisting the dressmaker could have been other stitchers or apprentices, known as “learners”.

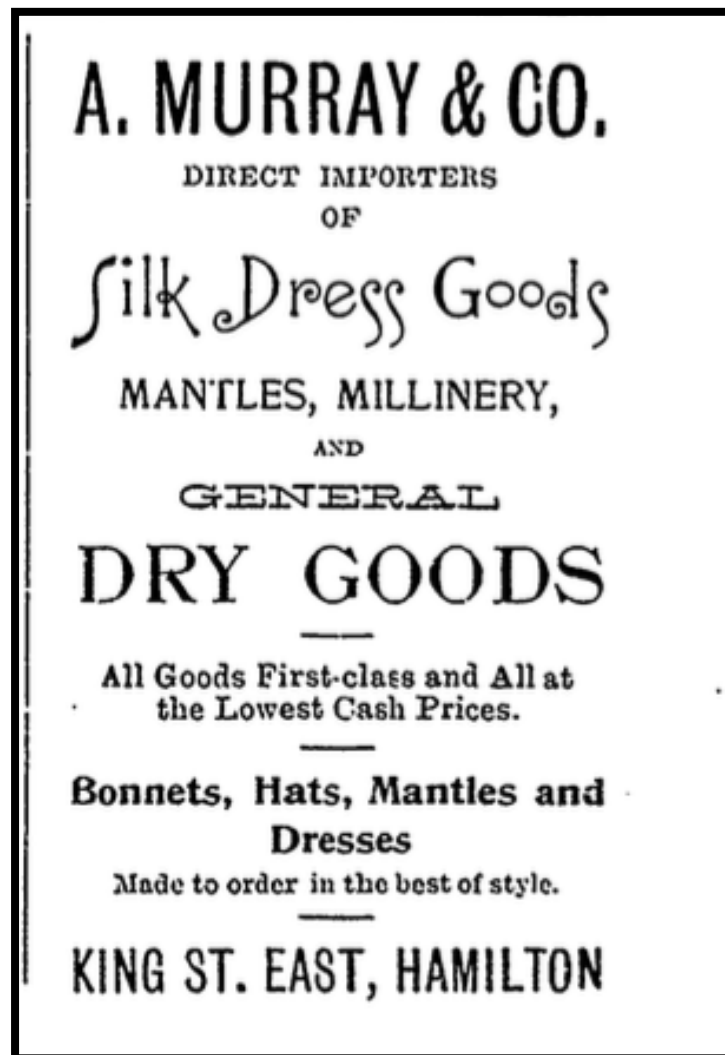


Figure 40: Advertisement indicating dresses made-to-order or a dressmakers were available through the store (The Portfolio February 1895, 3)



Figure 41: Close up of the label inside Garment B (A. Gilbert)

**STAMPED DRESS BELTING.**

An enterprising idea in selling dress belting is carried out by

***M<sup>rs</sup> Junior,***

**131. WELLINGTON ST. W**

**TORONTO**

John Macdonald & Co. This consists in stamping the dressmaker's name on every 27 inch, or other length required. This is done in the style indicated in the accompanying cut, and is much prized by dressmakers.

Figure 42: Advertisement for stamped dress belting  
(The Canadian Dry Goods Review March 1896, 49)

This advertisement was aimed at dressmakers. A. Murray and Co.'s is woven rather than stamped and does not have the dressmaker name, indicating the place of manufacture rather than the builder.

The dressmakers assembling the garments would have sewn them by hand as well as with a sewing machine, as can be seen along the seams in Garment B. In 1887, the sewing machine would

have been pedal-powered or hand-cranked rather than run by electricity. The first electrically powered sewing machines weren't available until 1920 (Light and Parr, 1983 90). In the sewing room there would be other necessary equipment such as irons and an ironing table. With a lack of electricity,<sup>22</sup> the irons would be heated on a cast iron stove. They may have had irons that were heated with coal or paraffin, but the latter tended to release gases and affect the users (Sambrook 1983, 16-31). Pressing is essential to professional quality garments. The stitchers also needed smaller tools like cutting shears, cutting snips, thimbles, rulers, measuring tapes, pins, and needles. Also important, but often overlooked, would have been adequate light to see the work that is being performed. If electricity was available it would have been to light the rooms in the store, rather than to run equipment. It is likely that rooms were still gas lit or used sunlight from the windows (Light and Parr 1983, 90).

In addition to dressmakers and Alexander Murray, the only other employee mentioned was Alexander's son James, who worked as a clerk in the store. Since it occupied three addresses, it is highly likely that other workers would have been employed there, as it would have been impossible to run such an establishment without them. There would have been other sales clerks selling the fabrics and notions to build garments and other soft goods. Sales clerks were generally men, but as the nineteenth century drew to a close, more women were seen working in shops across Ontario (Light and Parr 1983, 93).

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<sup>22</sup> Over the latter half of the 1880s, electricity became available to more and more of Hamilton's businesses and citizens, but it was not completed until 1890. Big factories and manufacturers were first to gain access to this public utility (<https://electricity.ca/learn/history-of-electricity/>).

## The Garment Gets Worn: Clara Bell Waddell and Garment B

One of the customers whom we know purchased fabric and had a garment made from A. Murray & Co. was Clara (Clarissa) Bell Waddell. Her wedding date was registered for June 8, 1887. It is unknown how long her engagement to Eli Van Allen had been, so there is no sure way of knowing when the fabric was ordered and the dress completed prior to their wedding day.

Clara Waddell was 24, born on March 3, 1863 (baptismal registry- Centenary Methodist Church). She was the daughter of William W. Waddell (born 1835 and died 1887) and Mary Jane Abraham (born 1831 and died April 14, 1907). In addition to Clara, they also had four sons; William (Harry) (died 1887, at age 22), Robert G. Byron (died 1879 at age 25), James Lewis Thomas (born April 14, 1857, death unknown), and George (died January 7, 1917 at age 40).<sup>24 25 26</sup> They were members of the Wesleyan Centenary Methodist Church on Main St. In 1887, they lived at 122 John St. South, not far from Gore Park and the church (Year Book and Directory Hamilton Methodist Church 1898; Registrations of Marriages). William was a grain dealer who passed away February 3, 1887 from bronchitis (Census reports 1861, 1871, 1881; Death Registry). William passed away (at age 21) a week prior to Clara's wedding day on May 29 (Death Registry; Waddell headstone).<sup>27</sup> See Figures 43, 44, 45 and 36.

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<sup>24</sup> All records list William Waddell, with no middle name only the initial 'W'.

<sup>25</sup> Records list William Waddell, tombstone lists as Harry Waddell, implying middle name as Henry.

<sup>26</sup> James Louis Waddell's birth and baptism are listed in the Wesleyan Centenary Methodist Church records, but no other documentation could be found about his death. This includes the family headstone and census records.

<sup>27</sup> This is according to the death records found on-line Death Registry Wentworth 020844, 3 and there is conflicting evidence with the headstone. The dates here read William, father, died on February 3, 1881 and William (Harry) May 1881. For the purposes of this study we are going with the date found in the death registry, but this inconsistency should be noted.

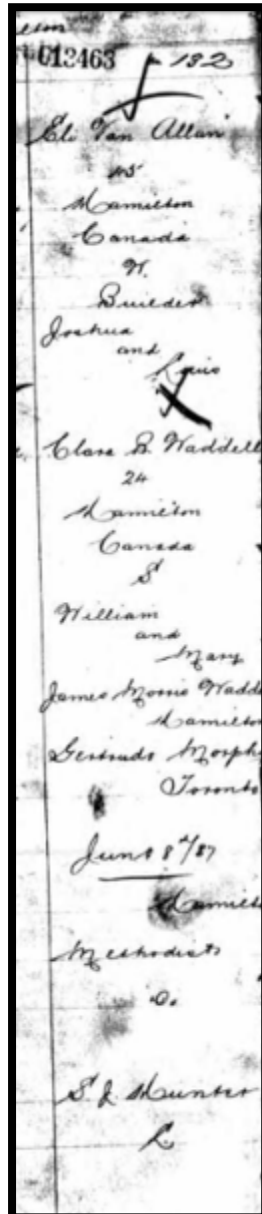


Figure 43: Marriage Registry for Eli Van Allen and Clara Belle Waddell June 8, 1887  
(Registrations of Marriages)

Name and Surname of Deceased.	William W. Waddell
When Died.	February 3 <sup>rd</sup> 1887
Sex—Male or Female.	M.
Age.	52 yrs ✓
Race or Profession.	Grain dealer
Where Born.	Canada
Certified cause of Death, and duration of Illness.	Bronchitis 3 hours
Name of Physician, if any.	G. C. Husband
Signature, Description and Residence of Informant.	G. C. Husband Hamilton
When Buried.	February 4 <sup>th</sup> 1887
Religious Denomination of Deceased.	Methodist
Signature of Registrar.	T. Beasley
REMARKS.	

021127

Name and Surname of Deceased.	William H. Waddell
When Died.	May 29 <sup>th</sup> 1887
Sex—Male or Female.	M.
Age.	21 yrs 16 mos
Race or Profession.	clerk
Where Born.	Hamilton
Certified cause of Death, and duration of Illness.	Phthisis. 2 yrs
Name of Physician, if any.	J. Miller
Signature, Description and Residence of Informant.	J. Miller Hamilton
When Buried.	August 5 <sup>th</sup> 1887
Religious Denomination of Deceased.	Methodist
Signature of Registrar.	T. Beasley
REMARKS.	

020844

Figure 44: Death Registries for William W. Waddell and William H. Waddell  
(Death Registry)



Figure 45: Waddell Headstone

Listed are: William W., Mary  
J. Abraham,  
Robert, and Harry Waddell  
(William H.)

(A. Gilbert)

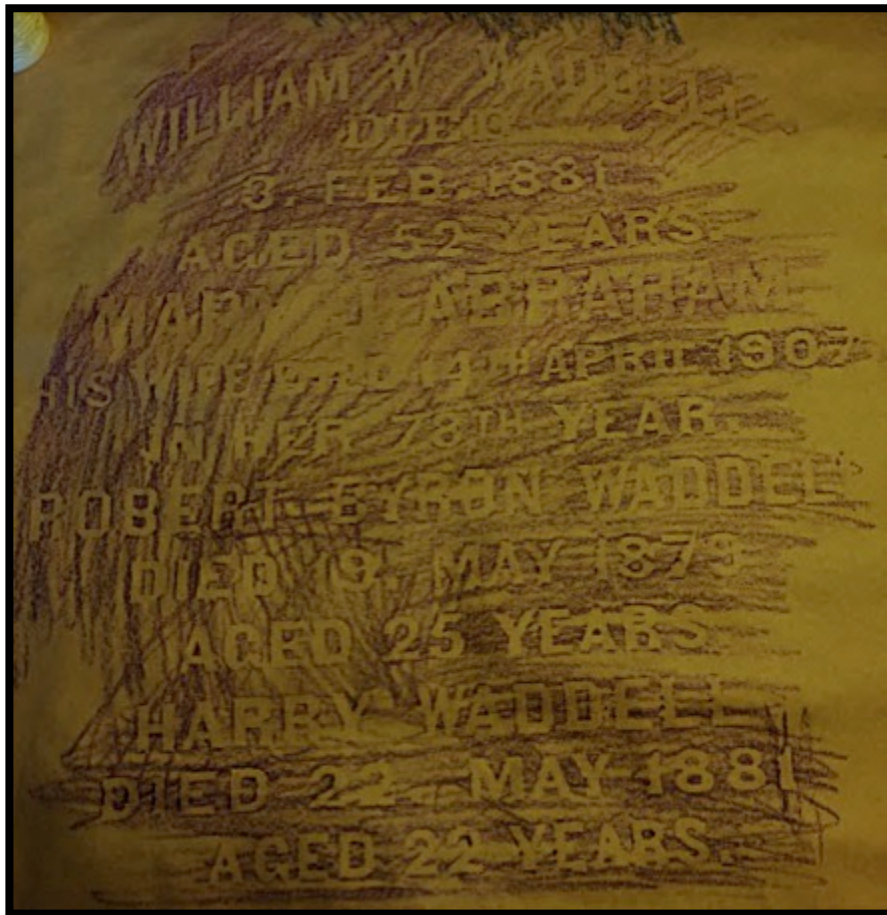


Figure 46: Rubbing of Waddell Headstone  
 The headstone was very difficult to read. I decided to do a rubbing  
 of the headstone early January 2016 to help clarify dates  
 (A. Gilbert)

There is no way of knowing who picked the fabrics and the style for Garment B. Chances are Clara did not go alone to pick out her wedding garment. It is also highly likely that it was her parents (or the estate) who paid for this expense. While Mary Waddell would have then become the head of the family following her husband's death, this did not necessarily guarantee that the estate and monies went directly to her. Laws in Canada had restrictions on women owning property and instead estates went to the sons. Frequently in wills money was placed aside specifically for the widow or she remained dependant on her son(s). Funds were also set aside for



mourning garments to be made available to the widow. Money may have been set-aside for Clara for such items to be purchased (Bradbury 2011, 256). Garments and fabric were costly, even with the decreasing prices that the industrial revolution brought. It was not common for dresses to be single-purpose use, like wedding dresses today. While wedding dresses were becoming increasingly popular they were not always an option for some women. This dress may not have been built with the main intention of being worn at her wedding; it may have been purchased and made with broader intentions in mind. At a later date Clara may have chosen to wear this as her wedding garment. While style guides from magazines and newspapers would have informed her on the most up-to-date trends, they were also full of advice as to what was appropriate and expected for wedding gowns and how to wear the same garments for other events. Garment B with two bodices and a removable train would have served its purpose for her wedding but made them modifiable for events she would have to consider as the wife of a businessman and city alderman (Barnard 1996 36).

Clara would have worn this garment with several other layers beneath it. She would have worn a cotton chemise, long underwear, a corset, stockings and petticoats. In order to achieve the desired silhouette, a bustle would have been worn under the back portion of the skirt, either a small horsehair or a more structured, wired bustle. On her head, she could have worn a hat with or without a veil, as was common bridal wear. Special symbolic flowers may have also trimmed the hat or veil. On her feet she would have worn either ankle height boots or shoes. Clara may have also worn some jewellery to complete her outfit. Possible other accessories would include gloves, a delicate purse, and a parasol.



Figure 47: Eli Van Allen  
(Hamilton Herald January 21, 1892)

Eli Van Allen, Clara's husband, was a prominent figure in the city of Hamilton. Born of Dutch ancestry in 1839 in Oakville, Ontario, he moved to Hamilton in 1868 after living and working in New York. Eli married his first wife Isabella in 1857 and together they had four children: George, Frank, Edwin and Mattie (who died at the age of 16) (Isabella Van Allen tombstone; Mattie Van Allen tombstone; Canadian Censuses of 1861, 1871). Like the Waddells, they were members of the Wesleyan Centenary Methodist Church on Main St. On June 15, 1885, Isabella passed away and the family held a funeral for her in their home on 5 Bay St. S. (Headstone of Isabella Van Allen; *Hamilton Daily Spectator* June 16, 1885). Earlier records indicate Eli was a carpenter, later listed as a builder with his own set of workers. Eli and his team constructed several important buildings around Hamilton including the Post Office, the Court House and the Customs House (Canadian Census 1861, 1871, 1881; Bailey 1981, 177, Campbell 1966, 154). In the early 1880s Eli was the alderman of Ward 3 for the city of Hamilton (Bailey 1981, 177).



Figure 48: Centenary Methodist Church 1906  
([www.hamiltonpostcards.com](http://www.hamiltonpostcards.com))



Figure 49: Interior of Centenary Methodist Church 1906  
([www.hamiltonpostcards.com](http://www.hamiltonpostcards.com))



Figure 50: The Jail built by Eli and his team  
(Rich 1892, 51)



Figure 51: The Post Office built by Eli and his team  
(Rich 1892, 39)

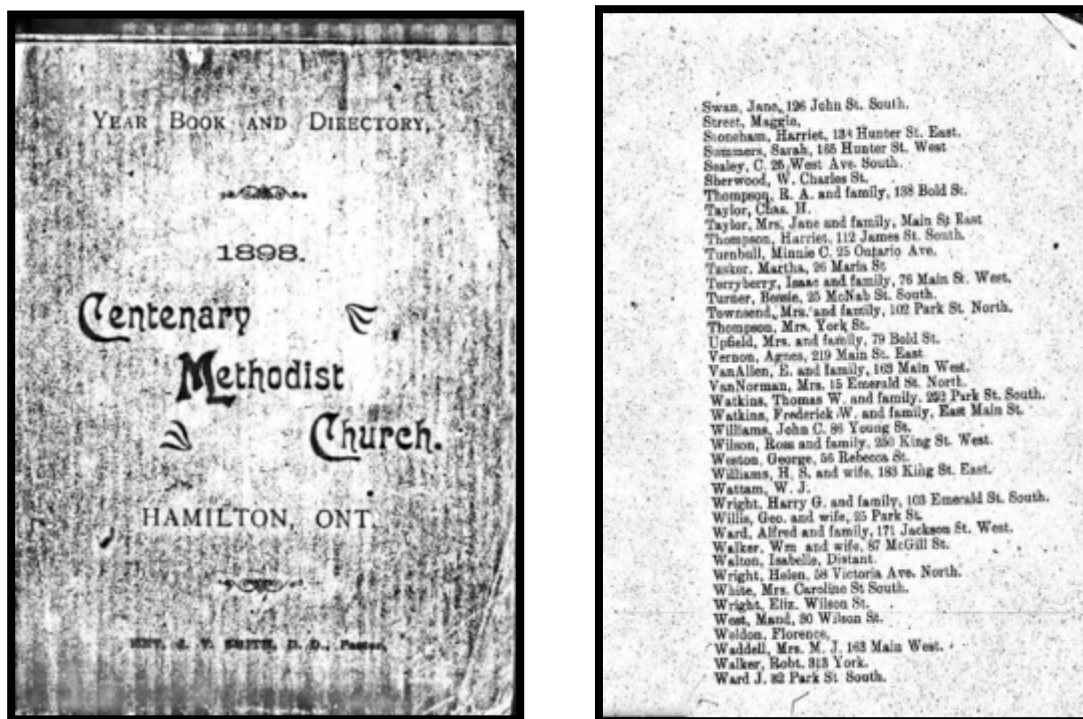


Figure 52: Year Book and Directory Hamilton Methodist Church 1898

Please note: Van Allen, E. and family, (no mention of Clara)

and Waddell, Mrs. M.J. (Clara's mother- both living at the same address)

([http://interactive.ancestry.ca/34647/30819\\_104184\\_\\_000100002/333216?backurl=http%3a%2f%2fwww.ancestry.ca%2fmyancestry%2fshoeboxpage.aspx&ssrc=&backlabel=Return](http://interactive.ancestry.ca/34647/30819_104184__000100002/333216?backurl=http%3a%2f%2fwww.ancestry.ca%2fmyancestry%2fshoeboxpage.aspx&ssrc=&backlabel=Return))

In 1887, at the time of their marriage, Clara was 24, 21 years his junior, and only one year older than Eli's youngest son Edwin, with Eli only seven years younger than Clara's mother Mary. While it was common for marriages to be between an older man and much younger woman, it appears that even this age gap was quite significant. Peter Ward remarks that larger age difference usually meant the marriage was for practical reasons rather than romantic ones (Ward 1990, 59). However, he does add, "Any age is the age for love, and companionship exists where one can find it" (Ward 1990, 59). As they were both members of the Wesleyan Centenary Methodist Church, it is very possible Eli could have met Clara at the parish. Finding a partner who was part of the same faith and community also followed the usual means for finding a spouse in Victorian Canada (Ward

1990, 170). It was common for engagements to be lengthy to allow enough time for both parties to be certain of the union (Ward 1990, 102 and 104). Currently there is no way of knowing how long the engagement was for Clara and Eli. We do know that Eli's first wife, Isabella, died exactly two years prior, so it can be assumed no more than two years.

Clara would have many new challenges as a new bride especially with Eli's position in society. There would be public appearances, social parties and dances, and important business and social visits in their home. All of these would have been considerations for Clara's choice of wedding garment.

### **Reasons for Purple: A Bride in Mourning**

We cannot know, but we can speculate about the social histories of clothing and fashion. Because Clara's father died in February of 1887, four months prior to her wedding, and her brother William died within one week of Clara's wedding day, it would be safe to say that Clara and her family were in some state of mourning. Mourning customs, especially mourning dress, in the nineteenth century was part of a strict and highly integrated code. In Europe, a daughter mourning her parents could have done so for two and half years, while mourning for a sibling was a total of six months (Taylor 1983, appendix 2). Many new Canadians kept their culture's mourning rituals to some degree (Bradbury 2011, 2). So strict were these customs, whether you were in the aristocracy or the working poor, that donning mourning clothes nearly had a "cult following" (Taylor 1983, 90). However, by the end of the 1880s these tight reins were beginning to loosen (Taylor 1983, 118). Men, women and children each had their own designated list of garments they were required to wear. What one wore and for how long depended on who had died, whether it be a monarch, parent, sibling or child (Bradbury 2011, 2).

Men and women had very different rules of conduct to follow. Men could cease wearing their mourning attire the day after the funeral and for some this meant wearing just a black armband, rather than an entire black outfit (Taylor 1983 101). Women however followed a much stricter and complex regime. So integrated and so lengthy were the time periods that mourning clothes were essential parts of any woman's wardrobe. Fashion trends were also expected to be followed - usually set by the upper classes. Women had clothes made specially or borrowed items that were missing from their closets. Some dyed paler dresses to accommodate the social expectations of mourning dress (Taylor 1983, 93; Bradbury 2011, 209).

There were four stages of mourning: first, second, ordinary and half-mourning. Each stage had a designated time allotted, depending on whom the lady was mourning. Within each stage was also a set rule of dress, which included specific types of fabric, fibre content, finish (matte or shiny) and colour (Bradbury 2011, 211). The lengthiest time period was a widow for her husband with a total time of two and half years, "cloaking widow's bodies into their husband's shadows" (Bradbury 2011, 209). After a year and a day of wearing all matte black, colour and sheen were slowly introduced (Taylor 1983, 103-115, appendix 2; Bradbury 2011, 234).

Weddings provided a break from the bleak black clothing and accessories women were expected to wear. In fact, some saw wearing their mourning attire to such a function as bad luck. Brides could also be relieved of their mourning garment obligations and don brighter, yet acceptable colours (Taylor 1983, 214-217).

The list of colours that women could wear in the mourning periods included: lavender, slate, grey, soft mauves, violets, lilac, pansy (quite a red purple), scabious (similar to lilac), heliotrope (very similar to a deep purple) and purple. Vibrant shades of purple - such as Parma Violet,



(introduced with aniline dyes) or the vivid shade of Garment A - were not acceptable. Some brides wore white, which was becoming more popular as a wedding dress colour, while many wore grey (Taylor 1983, 115, 217; Bradbury 2011, 234). Queen Victoria was a prominent figure of fashion and custom in the nineteenth century. While purple was a colour associated with royalty, it was also part of mourning colours and she wore purple velvet on several occasions (Taylor 1983, 131-2).



Figure 53: Queen Victoria in Purple  
(Queen Victoria, 1861. John Jabez Edwin Mayall/Hulton Archive/Getty Images.  
[www.thoughtco.com/queen-victorias-golden-jubilee-celebrations-1774008](http://www.thoughtco.com/queen-victorias-golden-jubilee-celebrations-1774008))

Could it be that one of the reasons Clara's colour choice for her wedding dress was to accommodate the rules of mourning for her father and brother? It would have been an excellent compromise, the choice of the lighter lavender with the darker purple velvet, while also in keeping



with the fashions of the late 1880s. It is a combination of light and dark mourning colours, while still a happier colour for her wedding day.

### Reasons for Purple: Posterity

The aniline dyes are not exempt from this actinic action (so useful to the photographer, so prejudicial to the dyer) (Dronsfield and Edmonds 2001, 82)

While mourning traditions may have been a factor in choosing purple and lilac fabrics, so would be the custom of taking photographs. A wedding day is full of expectation, tradition and celebration. It is a day where specific events take place: the ceremony, with the signing of a registry and the exchange of rings, and a celebration afterwards with family and friends. What was becoming increasingly popular in the nineteenth century was the inclusion of wedding photographs to commemorate the occasion. This may have been on the day, prior to or after the event.

What has come to light regarding nineteenth century technology is that certain colours of clothing appeared better than others in the final photographs, specifically the colours that sit in the purple range.

Dress—The clothes worn may evidently add a further complication to such of these difficulties as exist, or may produce where they did not. Let us suppose that a lady with dark hair and complexion presents herself to be photographed, attired in white, or light blue or purple. It will follow that by the time that justice has been done to the face, the fine gradations of shade in the dress may be lost, or if preserved, it can by great skill and some good fortune of the part of the photographer. Found in the *Manual of Photography* (Lea 1868, 154).

Hints: Pertaining to blue, purple, lavender, plum, magenta and pink, photograph VERY LIGHT (*Anthony's Photographic Bulletin* 1882, 147).

Currently there are only a couple of references that could be found to support this fact.

This is an intriguing piece of information that is worth mentioning in this thesis because it indicates another form of technology influencing change and choice in fashion. Open a photography manual

from the nineteenth century and large sections are devoted to the chemicals required to pre-treat the surface and to transform the negative onto the surface. These chemicals, along with the camera equipment itself, seem to be at the root of why the purple colour range appeared differently. Chemistry was a booming industry in the nineteenth century, with regards to both textiles and photography.

While Clara may have chosen purple because of the occasion of a wedding mixed with mourning rituals, she may have been concerned with how the wedding photographs appeared when colour and fabric would have been a factor. Velvet fabric has a nap, which is to say the fabric has a direction. Run your hand along velvet and the pile feels smooth one way, run your hand in the opposite direction, it feels rougher. How velvet sits, whether or not the pile is up or down, influences how light is absorbed or reflected. In Figure P1 there is an example of velvet in the girl's skirt. You can see how lush and dark the fabric looks. There is a definite lustre because of the nap of the velvet. The nap and the colour of this purple velvet would have had a remarkable effect in Clara's wedding day photographs.<sup>28</sup>

### **Reasons for Purple: Personal Preference**

There are countless reasons why people wear the clothes they do, but one cannot forget personal taste and inclination. If Clara were alive today we could ask her why she chose purple for this garment. She might reply because it was a colour she adored, or because it reminded her of a particular place or person or time in her life. It may have made her feel a certain way or felt it complemented her skin and hair. Clara may not have even had strong tendencies one-way-or-

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<sup>28</sup> Lighting plays an important role with velvet and direction of the pile. Laying on the table under the dim florescent lights in the storage room of Black Creek Pioneer Village the velvet appears almost black in the photographs.

another, and she may have even been following the recommendation of the salespersons from A. Murray and Co. as to the latest trends in fashion.

All of these factors - where Clara was in her life and the new life she was entering, a time of mourning mixed with a time of great sadness, the possibility of taking pictures - all mixed with personal taste could have come into play when making her visit to have these pieces made, nearly 130 years ago.

### **Garment B, Beyond the Church, Home, and into the City**

What else can we learn from the dress? A dress like this was never worn just once. As we saw earlier, Hamilton in the late nineteenth century was a vibrant city, bustling with activity. From the records that remain, the Van Allens took a keen part in these events. Participating in these events would have required the correct attire, providing ample opportunity for Garment B to be worn after their wedding day. Eli was an alderman of Ward 3 of Hamilton's City Council from 1881 until 1894 (*The Globe* February 15, 1910, 2; Bailey 1981, 177). He was politically conservative, known as the "apostle of the economy", making sure that "the rate of taxation must be kept down to the lowest possible match", but was well liked by Hamilton's public (*Hamilton Daily Times* April 22 1892, 98). He was commended on having the highest attendance rate of any alderman. (*The Harold* December 28 1892, 129) While on council Eli sat on the Parks, City Hospital, Street and Railway committees, the Finance Commission and was Chairman of the Waterfront Committee. Eli was also a businessman, running his own construction company that built some key buildings in Hamilton. In 1890, he switched business paths and began the E. Van Allen Shirt Company, which made Starr

Brand shirts (Location T of Map of Hamilton). This company was so successful that two new buildings were added to the George St location (Bailey 1981 177).

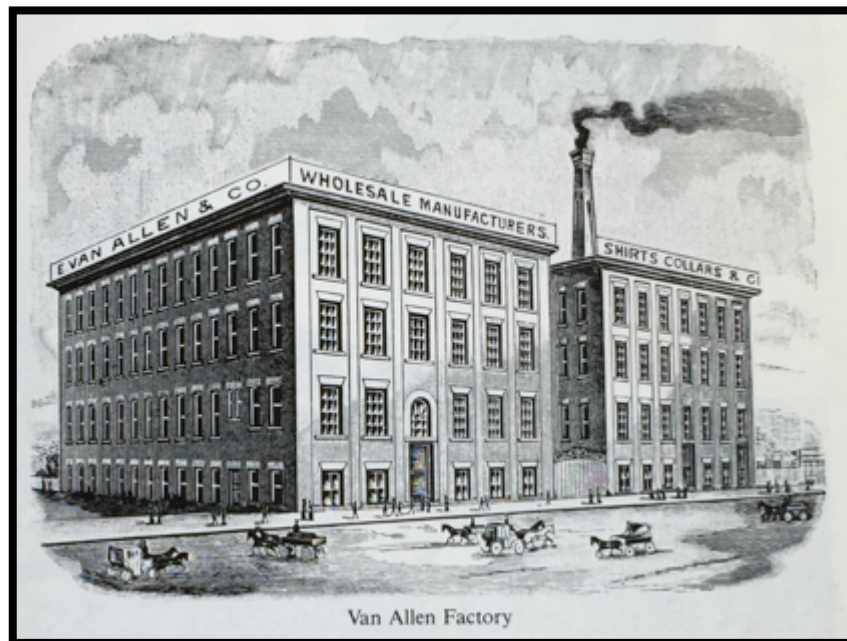


Figure 54: Image of E. Van Allen and Co. Shirt Factory  
(Bailey 1981)



Figure 55: Advertisement  
for Star Brand Shirts  
Eli's company

(The Canadian Dry Goods  
Review January 1898, 78)



Figure 56: Advertisement for Star Brand Shirts

(The Canadian Dry Goods Review May 1897, 15)

Because of his full schedule some of the committee meetings were held at his Bay Street home, despite some public criticism (Hamilton Local Archives, 189?). This is where Clara's role as a supportive wife would have come into play. She would have had to be sure her home was prepared and welcoming for these and other business meetings. Clara would have also had to wear appropriate garments for such occasions. She would have had her own guests, other members of the community, visiting her home for social calls.

Being part of city council also meant attending public functions, such as openings of buildings, parades, and statue unveilings. The opening of the purpose-built public library (located next to the Centenary Church, location N on Map of Hamilton) was one such event on February 16, 1890. It was a highly publicized affair, with the Earl of Aberdeen and his wife as well as other city councillors and their guests in attendance, all gathered around the platform listening to opening day speeches and the Band of the 13<sup>th</sup> Battalion. The rooms of the new library were "filled with

fashionably dressed men and women” (Henley 1989 74-76). Clara and Eli were very likely to have been in attendance on such an important day for Hamilton; another opportunity for Clara to wear Garment B.

The Van Allen family, as well as Clara’s mother Mary Waddell, attended the Centenary Methodist church. It was the church where Clara was baptized and married. They would have attended church services and other related events such as baptisms, weddings and funerals. It was a public place that she attended, requiring, like city events, appropriate garments to wear (Year Book and Directory Hamilton Methodist Church 1898, 29).

One of the stories about Hamilton in the 1880s was that of the travelling evangelical preachers Reverend J. Crossly and Reverend J.E. Hunter, who visited many parishes in Hamilton, including the Centenary. In the early winter on December 9, 1889 the two preachers, known for their dramatic sermons, gave a controversial address about the evils of balls and dancing. They claimed any decent woman dared not attend such events, for fear her “soul would be in dire need of salvation”. Hamiltonians loved their public dances and balls, especially at this time of year, during the Christmas season. In reaction to this statement, the Dance committee made attempts to show how respectable and in the very best taste their popular annual ball was at the Masonic Strict Observance Lodge, held on December 20<sup>th</sup> (Location M on the Map of Hamilton). This could have been an event that Clara and Eli might have attended, being members of the lodge, the church, city council and the community. This would have been a perfect event for Clara to wear her Garment B (Bailey 1981, 177; Henley 1989, 36-38).

## **Clara's Dress - Unworn But Still In Use: Hamilton, Nelson Township and Toronto**

The story of Garment B does not stop at the events and places it would have been worn. The deconstruction of the garment adds to its life. This is contrary to most garments that are normally seen by the public in museums. Most often displayed are the pieces that are the most pristine. They are easier to display, more durable and pleasant to see. Garment B has one dress shield, still attached to the armhole of the Bodice 2. Despite this attempt to protect the garment, there are sweat stains from its consistent use, letting us know that Clara wore it often.

The silhouette of the 1880s transitioned by the middle of the 1890s. Gone were the swathing fabrics about the skirt front and the excessive bustle in the back. The overall shape of skirts was more A-line than bell-like. The fitted arm grew into large leg-of-mutton shape - bulbous at the sleeve head, requiring nearly 3 yards of fabric for each arm. The pigeon chest, found in Clara's dress as well as most garments of the 1880s, became even more exaggerated; usually extending from a yoke and blousing from the waist, sometimes even requiring extra padding (like Garment C).

These changes in fashion would have been the mostly likely reasons Clara would have ceased to wear Garment B. It is also possible, especially with the birth of her first and only child, Mary Alma, (born 1891) that her body changed and could no longer fit the skirt and bodices; even with the aid of the Victorian lady's corset (Van Allen/Holton Tombstone). The expectations of fashion placed on a business and public figure's wife would have also played into factors for requiring new frocks. Looking at how clothing changed from 1887 onwards, it would be unlikely that Clara would have worn any part of Garment B past 1895.

While the garment ceased to be worn, its life continued even after it was considered viable to wear. The sleeves and the panel of the skirt were removed. This tells us that Clara had intentions to

change or add to the skirt or the bodice - extending its life or using the pieces to add to another garment or make something new entirely. Taking apart clothing was a common practice in Canada, the United States and Europe. Fabric was expensive and people did not possess the extensive clothing collection we have in our closets today.. Clara may have used them for a dress for her own daughter or another dress of her own. It was also common for off cuts and old garments to be repurposed as fabric for quilts.

In addition to family, church and public events, Clara had her own interests. In 1897, she was the vice-president of the King's Daughters and its Officers<sup>28</sup> when they held their first meeting at Hamilton's public library (*The Globe* November 23 1897, 2). Clara and her mother Mary were also members of the Ladies Committee of the Wentworth Historical Society. In November of 1895, the committee held a fundraising event known as the Military Encampment at the Hamilton Drill Hall to raise money for the Historical Society Museum and to preserve the site of the Battle of Stoney Creek (location D on the Map of Hamilton). A souvenir program was produced with stories of Wentworth's past, as well as a list of the members and the participants of the event. William Murray of A. Murray and Co. wrote a poem for the book. Small plays re-enacting different events of Canada's past performed by the ladies of the committee, complete with costumes and props, formed a major part of the program. As a member, Clara may have contributed to this event by amassing and creating the costumes, props and set (see Figures: 63, 64, 65) (Committee 1895). The missing sleeves and skirt front of Garment B could have become part of this dramatic event.

Ultimately, we can never know what happened to the absent pieces of Garment B, but this

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<sup>28</sup> The King's Daughters and Sons (as it was also known) began in New York City in the 1880s. By the 1890s the organization had its own branches across Ontario including: Toronto, Ottawa, Kingston and Hamilton. This group was affiliated with the Methodist church and its mandate was to help local charities (<http://thekingsdaughtersandsons.ca/documents>).



important occasion does help to add to the story of the garment and the wearer. The following images are from the plays performed at the Military Encampment. One of these women could be Clara Van Allen.



Figure 57: Hamilton Public Library (date unknown)  
([www.hamiltonpostcards.com/pages/municipalbuildings.html](http://www.hamiltonpostcards.com/pages/municipalbuildings.html))

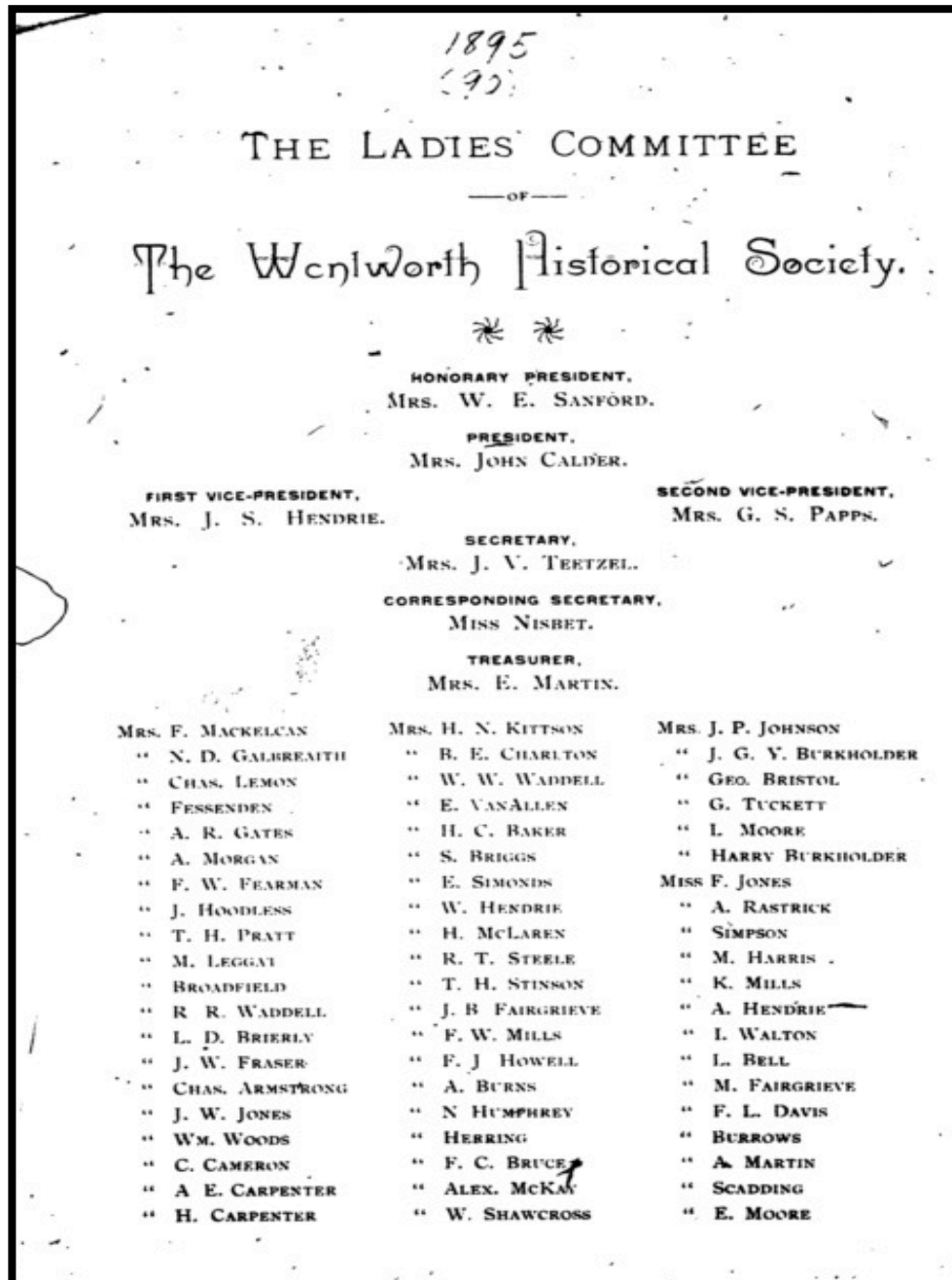


Figure 58: The Ladies Committee: The Wentworth Historical Society (1895)  
Souvenir Book and Program for Military Encampment  
Second Row, 4<sup>th</sup> one down, Mrs. E Van Allen or Clara  
(Committee, 1895)



Figure 59: Images for the Military Encampment 1895  
(Battlefield House Museum, Stoney Creek, Ontario. [www.virtualmuseum.ca](http://www.virtualmuseum.ca))



Figure 60: Images for the Military Encampment 1895  
(Battlefield House Museum, Stoney Creek, Ontario. [www.virtualmuseum.ca](http://www.virtualmuseum.ca))

Life continued for Clara, Eli and their daughter Mary Alma. In 1907 on April 14th, Clara's mother Mary Waddell, at the age of 78, passed away and was buried at the same gravesite as her late husband and children at the Hamilton Cemetery (Waddell Family Tombstone). Eli continued growing his company, working with his son Edwin. In 1892 and 1894 Eli also ran for mayor. He was unsuccessful in achieving the seat, despite his popularity amongst Hamiltonians (Bailey 1981, 177). Despite his defeat, he persisted to work on city affairs, sitting on various committees. Eli's last post was becoming the Chairman of the Beach Commissioners (Bailey 1981, 177; Local Hamilton Archives *The Herald* (?) February 14, 1910).

On February 14<sup>th</sup>, 1910, Eli was “suddenly called away” and died from apoplexy in their home on 163 Main St. in Hamilton. He was nearly 71 years old. A private funeral was held at the Van Allen’s home and he was buried in Hamilton Cemetery in a new Van Allen plot (*The Globe* February 15, 1910; Van Allen family headstone). Two and a half years later on November 7, 1912, at the age of 20, Alma married Luther Janna Holton (age 24) (Registrations of Marriages). Like her parents, Alma was married at the Centenary Methodist Church on Main Street. Clara kept the Main Street home and Alma and Luther lived with her. In 1920 the Holtons moved to 133 Edgecliff Place, Nelson Township (which is now 5006 Lakeshore Road, Burlington. The home was demolished in 2004). The Edgecliff Estate, as it was known, was their main home and Clara joined them there, presumably, bringing her own items with her, which would have included Garment B. Clara died on November 16, 1921 after being hospitalized for complications from appendicitis at the Hamilton Hospital (Archives of Ontario; Toronto, Ontario, Canada; Series: MS935; Reel: 284). Clara joined Eli at the Van Allen plot in Hamilton Cemetery. Alma remained at the estate until 1944 (Irwin, Jane <http://images.burlington.halinet.on.ca/2394773/data?n=8>). The next address where Alma can be found is in Toronto at 184 Heath Street, near St. Clair and Avenue Road (Glendale Spinning Mills Ltd. Shareholder May 8<sup>th</sup>; 1963 Holton files; *The Globe and Mail* June 25 1970, 53). Alma remained at this location until her own death on June 23, 1970. A small funeral was held at her home and she too was buried at the Van Allen/Holton gravesite back in Hamilton (*The Globe and Mail*, Jun 25 1970, 53; Waddell/Van Allen family tombstone)<sup>29</sup>.

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<sup>29</sup> For further details of the years between 1912-1970 see the Appendix on page 117.





Figure 61: Edgecliff Place 1952  
(City of Burlington Report PB-67-12. 11. Page 12)

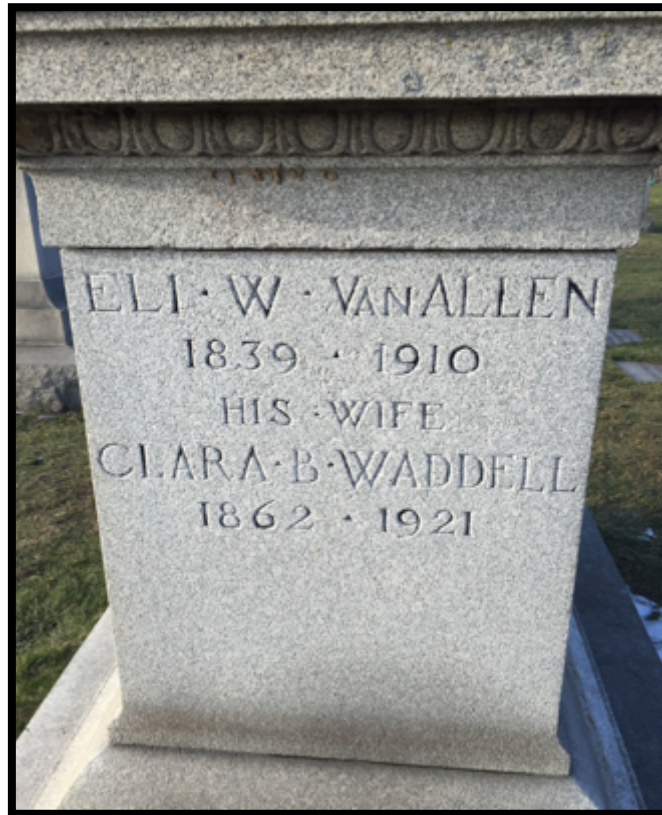


Figure 62 and 63: Headstone and Plot For Clara and Eli Van Allen  
in Hamilton Cemetery. April 1<sup>st</sup> 1862-Nov 16<sup>th</sup> 1921  
(A. Gilbert)



Figure 64: 184 Heath Street West in Toronto  
The last known address for Clara's dress prior to donation to  
Black Creek Pioneer Village in 1971  
(A. Gilbert)

When a family member dies their things are sorted through. Some pieces are given to family members, others sold or given to consignment stores or charitable foundations. In Alma's case, her family members, very likely her children, could have been following instructions from her will or decided on their own to donate Garment B and several other items. Within six months of Alma's death in 1970, Garment B was donated to Black Creek Pioneer Village, as noted by the accession number. BCPV chose to keep the name of their donor private. This timeline suggests that Alma brought Garment B with her from her Nelson Township home to Heath Street in Toronto, the last leg of the journey Garment B from its formation in 1887 until 1971 when it was placed in Black Creek Pioneer Village's artifact storage.



Museums are where the past is brought into the present. Waiting inside a storage box wrapped in acid-free tissue paper was Clara's dress. There it remained until the summer of 2013 when I opened the long archival box and re-discovered the garment - the two bodices, skirt and one beautiful purple train.

## Chapter Four: Reflections, Notes for Further Research and Conclusions

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In this thesis, I have discussed the transition from natural to synthetic dyes by examining in close detail three purple garments dated 1865, 1887, and 1900. The test results from these garments indicate that both natural-brazilwood and indigo dyes were used in combination with Basic Violet 1 and 14 and Basic Green 4. This examination went further into detail about the potential journeys these dyestuffs and the fabrics took to become purple garments. This project concludes with an in-depth look at why Clara Van Allen, a woman from Hamilton, Ontario may have chosen to wear purple.

In this chapter I reflect on the primary materials I have referenced to dig deeper into the textile and fashion industry in Canada in the latter half of the nineteenth century. I also comment on the trickiness of finding Clara in the documents. The chapter continues with my own journey while working on this project and how different life is now 140 years later. I conclude with thoughts and possible further investigations that have arisen from my research with dyes, fashion and society.

### The Materials

Because this study focused on garments from Canada, I felt it necessary to determine if any part of the dyes or silks could have been manufactured here. The likelihood increased with each garment. It is extremely likely that Garment A's textile goods were imported from Europe, probably Britain (*Monetary Times Trade Review and Insurance Review Chronicle* November 14 1884, 547). With Garment B, it is possible that the lilac silk was manufactured here as there were some silk factories producing plain silks by the 1880s in Montreal. If not manufactured in Canada, then the United States. Live silk cocoons or raw silk bobbins were imported from China or Japan and then spun,

died, and woven either in Massachusetts, Michigan, USA and Montreal, Canada (Corbet, Mary 2015, <https://www.needlethread.com/2015/01/corticelli-silk-thread-color-card-with-real-thread-samples.html>). Special high-speed silk trains transported this expensive cargo from Vancouver (Chandler 2006, 18). The more complicated weaves, like the purple velvet, were still produced in Europe (*Dominion Dry Goods* May 1884, 181 and 189; *New York Times* May 1879, 5; *Canada Under the National Policy 1883*; *Canadian Manufacturer* June 7 1889, 366; *Monetary Times and Trade Review Chronicle* August 24 1888, 215; Wyckoff 1880 138-9). For Garment C, it is very probable that the fabric came from Canada, because by 1900, the silk factories in Montreal were well established. There also existed a large dye factory - the British American Dye Co. of Montreal and Toronto. It was the largest dye complex in Canada in 1887 (*Canadian Manufacturer* June 3, 1887). Canadian textile manufacturers were keen on establishing themselves as quality producers of silk to the Canadian market (*The Monetary Times and Trade Review Chronicle* November 5 1886, 525-6). Despite this, there is also a chance the finished silk came from China or Japan, with more and more being imported from the Far East (Chandler 2006, 18-19; *Dominion Dry Goods Review* May 1 1884, 171).

### Finding Clara in Primary Research

Finding Clara Van Allen was trickier than finding Eli her husband. There were two reasons for this: for one, Clara was frequently listed as Mrs. Eli Van Allen. Mary and Alma also adopted their husbands' names, as was the convention of the time. It makes tracking down a female in official records and articles very difficult, and it speaks volumes about how a wife was viewed. Other difficulties existed because of misspelt names or unclear numbers in documents. One could

associate this with penmanship, but mistakes are found in the typed information as well. However, the humans who made these errors added to the storytelling facet of the Garment B's travels.

### **My Own Journey**

It would be difficult for me to examine Clara's life and not compare it to my own. There were many similarities. We are both Canadian women from southern Ontario. Over the time I was researching and writing this thesis, I too lost my father, met my spouse, had a child, and abdominal surgery – twice, and survived. I could not help but imagine what life was like for her in the late nineteenth century, and how different - in nearly every aspect - it is from my own in the early twenty-first.

Technology and clothing have changed so much, as have the expectations of women as wives, mothers, and human beings. From the point of view of clothing nearly 95% of the clothes I own are made of stretchy materials. Clara's on the other hand, would likely have consisted of no more than 10% of her wardrobe (sweaters, winter accessories, hosiery and some undergarments). A significant proportion of my garments and accessories are man-made fibres, compared to Clara's closet that had very little. The average Canadian in the Victorian era did not own closets and drawers full of clothing, like the ones in my home. Nor did the average Canadian clean their clothing as frequently as we do today. There is very little in my closet that I can imagine keeping for the next 120 years.

I think of the ease and timeliness with which I have access to clean water (hot and cold), light, heat, cold, entertainment, information, food (selection), and modes of transportation. I think of the journeys make everyday. I can travel hundreds of kilometres and be there in a few short hours. Living in Toronto and the ability to travel means my "village" (work, school, family) or

community is not all within walking distance, but not so far that I cannot get to them relatively quickly. This distance I travel also applies to height – I currently live on the 22nd floor of a tall high-rise and have a view of this large city and all the other structures that create the skyline. This makes me wonder if Clara ever left Wentworth County, even to go as far as Niagara Falls, Toronto, or New York.

I think of the loss of her father and the relationship they might have had. I for one had a very open and honest relationship, with nearly no topics of conversation too taboo to discuss with my father. How formal was their relationship? I was told I could become whatever I set my mind to. My parents expected me to receive not only a high school education but also a post-secondary one. Currently, we do not know whether Clara even attended school. I also think of her relationship with Eli and wonder how much spouses shared and communicated. How much did their age gap influence how they functioned as a couple?

I also reflect on the relationship with my daughter and ponder the nature of Clara and Alma's. Clara lived with Alma, just as her mother Mary had lived with Clara and Eli. Were they close? Were they like-minded, or did they argue? Did her mother teach her any sewing and needle skills, the way my mother and grandmother did for me? And what about Garment B? The note in the accession file had the details of who wore the dress and the date it was worn. Clara must have shared this with Alma, who shared it with her children. How much of this story was passed along? Using saved garments makes me wonder about which items I will leave to my own children. In regard to my children and spouse, there is no necessity for me to be formally married from the point-of-view of society at large or my immediate family. While more women were entering the work force by the close of the nineteenth century, it was still the expectation that men were the

main income earners within the family dynamic. Today, I am the primary earner for my family; my male common-law partner stays at home with our child. I was also able to take time off from work with maternity leave. I also had my child at 39, which is closer to Eli's age than Clara's. In addition to the maternity leave as one of the rights Canadian women have today, voting is also a given. By the end of her life, Clara had the right to vote, while I (as well as my mother) have lived all of my life with this right already in place.

### **Further Investigations**

There are two features of this study that require further examination. The first is the link between the colour purple and how it appeared in photographs. There seems to be a connection between the two because of chemicals used at the time. What influence, if any, could photography have played on fashion in the nineteenth century?

The other query has to do with the discovery of Malachite Green/Basic Green 4 to make Garment B and C purple. The choice of the dye for its original purple seems strange, the outcome being a muddy colour, rather than a vibrant one. It appears that the colourists used the weakness of the dye - one that changed from green to purple - when enough heat was applied. The molecular structure of Basic Green 4 appears very similar to Basic Green 1 and 14, making this adaptation a likely possibility. This would be an excellent interdisciplinary investigation.

Other aspects of this thesis not yet mentioned that are worthy of further exploration: the social narrative and the dyes themselves. The questions and comparisons with my own life provide a platform for further exploration into Mary, Clara, and Alma's lives. If I were to continue, I would look further into the lives of each woman and how it improved and changed as each generation

was born, specifically focusing on education, women's rights, and the day-to-day life in the city of Hamilton (urban life in southern Ontario). I would also want to include the other donated items as part of the research. Additional artifacts mean additional insight to this family's narrative.

Finally, the area that requires further exploration is garments and the relationship with dyes. Using three garments of the same colour but in three different time periods allowed us to see a pattern of the type of dyes, both natural and synthetic. I would love to see a longer arc, with older garments prior to 1856 and after 1920. The timeline would continue with newer garments past the First World War, when synthetic dyes became the main source of dyes. What would the journeys look like then? Would the same pattern of the combined usage of dyes still hold true? The time period covered in this study shows that dyes and fabric came from around the globe - North America, South America, Europe, and Asia. Would they follow similar global patterns?

## **Conclusion**

By choosing Garment A (1865), Garment B (1887), and Garment C (1900) I was able to look at how natural and synthetic dyes were employed over a thirty-five-year span. I was able to prove that, despite the invention of the first commercially synthetic dye available on the market in 1856, natural dyes were still manufactured and used until the turn of the century. These dyes were used together because of the durability and colourfastness of the natural dyes and the brilliant colour produced by the synthetic. The journey has taken me around the world from Brazil, India, Germany, France, China, and Japan to discover the origins of dyestuff for the three garments. Explorations into Canada's fashion and textile industries shed light on the silk manufacture in

Montreal. It also took us to A. Murray's and Co. where the fabrics were sold and Garment B was constructed.

Because of the information provided in Garment B's accession notes, I was able to take the exploration of the colour purple even further and look into the events in and around the life of Clara Waddell. The journey concludes where I began, at Black Creek Pioneer Village. Despite Garment B being tucked safely away in artifact storage, the journey of Garment B still continues today, with each person who reads this thesis. The hope now, is that you the reader will see colour, specifically the colour purple, and fabric in a new way.



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## Appendix: Further Details about Clara's and Alma's life (1910-1970)

The Holtons were prominent factory owners. Luther's father William A. Holton, merged with the Messrs. of Easton, Pa. and New York in 1902 to form the Chipman, Holton Knitting Co. Ltd. to manufacture hosiery (Campbell 1966, 205). William A. was the president, and in 1910, Luther joined the firm as the secretary of the company. Mark, Luther's older brother, was with the firm from its inception, in the position as treasurer. Later in 1917, the Holtons established the Glendale Spinning Mills Ltd. in Hamilton, Ontario and in 1919 the Butterfly Hosiery Company Ltd. in Drummondville, Quebec (The Herald, June 29 1927, 8; Bailey 1981, 91).

**PARTICULARS TO BE SUPPLIED BY MINISTER, ETC.**

**BRIDEGROOM**

Name: Luther Janna Holton  
 Age: 24  
 Date of Birth: 02-17-10  
 Place of Birth: Hamilton  
 Occupation: Manufacturer  
 Religion: Presbyterian  
 Name of Father: William A. Holton  
 Name of Mother: Anna Eliza Hill

**BRIDE**

Name: Mary Alma Van Allen  
 Age: 20  
 Date of Birth: 05-15-12  
 Place of Birth: Hamilton  
 Occupation: None  
 Religion: Methodist  
 Name of Father: Wm. Van Allen  
 Name of Mother: Clara Maddell  
 Name of Father: Luther Janna Holton  
 Name of Mother: Mary Alma Van Allen  
 Name of Father: W. K. Balderson  
 Address: Hamilton  
 Name of Wife: K. B. B. B.  
 Address: Hamilton

**AFFIDAVIT**

**The Marriage Act.**

**Minister of the Gospel**  
J. V. Smith  
 Hamilton

**Registrar**  
J. C. Rea  
 Hamilton

**Date of Marriage**  
Nov 7 1912  
Hamilton

Figure 65: Marriage Certificate for Mary Alma and Luther Janna, November 7, 1912 (Marriage Registries)



Figure 66: W.A. Holton, president of the Chipman Holton knitting Co. Ltd. and his two sons Mark and Luther Janna (Alma's husband on the right) (Newspaper clipping 8. Clipping Files- Biography Holton Family of Hamilton)

Clara became a grandmother when Alma gave birth to her first child Mary Eleanor<sup>30</sup> on December 2, 1913<sup>31</sup> with William Van Allen following three years later in 1917 (exact date could not be located). Claribel, Alma's second daughter was born on September 22, 1919 (Birth Registry Wentworth, Hamilton 467; and 1921 Canadian Census Holton Family). Her own headstone remains, now partially covered over by grass, nearly 100 years after her passing. After Clara's demise, Alma and Luther had two more children: Luther Janna on July 11, 1922 and John M. born in 1925 (Holton/Van Allen gravestone).

<sup>30</sup> Mary Eleanor: December 2, 1913-January 11, 1988; William Van Allen: 1917-June 14, 1981; Claribel Briscels: September 22, 1919-October 1, 2012 is buried in Mount Pleasant Cemetery Toronto; Luther Janna: July 11, 1922-June 1, 2002; John Miller: 1925-1997.

<sup>31</sup> Claribel Holton was born at 62 Caroline St. South in Hamilton, which means the family held on to the home in Hamilton as well as the home in Nelson Township. It is possible that the dress moved to the Nelson Township home at a later date.



By the 1930s Luther was the vice president of the Chipman, Holton Knitting Co. and manager of the Glendale Spinning Mills Ltd. (*The Globe*, April 17, 1936, 1). Both Luther and Alma had stocks in the growing companies the Holtons owned and ran (Holton files: Articles, Wills).

On April 16<sup>th</sup>, 1936, at the age of 46, Luther suffered a horrible fate when he was accidentally shot in the left side of his face by his own rifle and died from his wounds. His intention was to shoot at a flock of crows (*The Globe*, April 17 1936, 1). Alma was 45, with five children between the ages of 10 and 23. The Van Allen plot expanded to include the Holton family (Van Allen on one side and Holton on the other) and Luther was buried there.

FORM 1

This form if placed in an envelope, marked "Provisional Medical Certificate for Registrar use 1936," and properly addressed will pass through the mail "FREE" 58

### PROVINCE OF ONTARIO CERTIFICATE OF REGISTRATION OF DEATH

NELSON 047906

1. PLACE OF DEATH: County or District of HALTON Township of NELSON  
 If in City, Town or Village: Frederickton Street Toronto-Hamilton Highway House No. 017906

2. LENGTH OF STAY (in years, months and days) 16 yrs  
 (a) In City, Town or Township where death occurred. (b) In Province. Life (c) In Canada (if immigrant)

3. NAME OF DECEASED: Hamilton, Luther James  
 RESIDENCE No. Toronto-Hamilton Highway City, Town, Village or Township. Province.

4. Sex M. 5. Nationality Canadian 6. Racial Origin English 7. Single, Married, Widowed or Divorced Married

8. BIRTHPLACE Hamilton, Ont.  
 (Province or Country)

9. DATE OF BIRTH July 24th 1889  
 (Month) (Day) (Year)

10. AGE in 47th yrs.  
 Years Months Days If less than one day old hrs. or min.

11. Trade, profession or kind of work as spinner, teamster, office clerk, etc. Manufacturer  
 12. Kind of industry or business, as cotton-mill, lumbering, bank, etc. Textile  
 13. Date deceased last worked April 16th 1936 14. Total yrs. spent in this occupation life

15. If married give name of wife or husband of deceased Alma Van Allen Holton

MOTHER, FATHER

16. Name William Arthur Holton  
 17. BIRTHPLACE Hamilton, Ontario  
 (Province or Country)

18. Maiden Name Frances Eleanor Hill  
 19. BIRTHPLACE Hamilton, Ontario  
 (Province or Country)

20. Person giving information sign here Mark Holton  
 Address Box St. South  
 Relationship to deceased Brother

21. Place of Burial, Cremation or Removal Hamilton Cemetery  
 Date of burial or removal April 18th 1936

22. Undertaker Blackford & Wray, Hamilton, Ontario.  
 (Name and address)

### MEDICAL CERTIFICATE OF DEATH

23. DATE OF DEATH April 16 1936  
 (Month) (Day) (Year)

24. I HEREBY CERTIFY that I attended deceased from:  
April 14 to after death  
 and last saw him alive on 18

CAUSE OF DEATH

(a) Accidental  
 Give cause, injury or condition due to which death occurred, and the mode of death, such as heart failure, apoplexy, etc.

(b) Gun shot wound  
 due to

(c) Left side of face  
 due to

25. If a woman, was the death associated with pregnancy?

26. Was there a surgical operation? 28 Date of operation 28  
 State findings Was there an autopsy? 28

27. If death was due to external causes (violence) fill in also the following:  
 Accident, suicide or homicide? Accident Date of injury April 16 1936  
 Manner of injury Gun shot wound on face  
 Nature of injury See certificate  
 Specify whether injury occurred in industry, in home, or in public place Home

Signed by James T. Doyle M.D.  
 Address Windsor Date April 17 1936

28. Division Registrar's Record Number Apr 20 1936  
 29. Filed Apr 20 1936 J. A. Pettit (Official Signature)

THIS FORM MUST BE FILED FORTHWITH WITH THE DIVISION REGISTRAR OF THE DIVISION IN WHICH THE DEATH OCCURRED BEFORE A BURIAL PERMIT CAN BE ISSUED. WRITE PLAINLY WITH UNFADING INK. THIS IS A PERMANENT RECORD. Every item of information should be carefully supplied. (See reverse side for instructions.)

Figure 67: Death Certificate for Luther Holton  
 (Death Registry Series: MS935)





Figure 68: Headstone for Mary Alma and Luther Jana Holton (and their son John) in Hamilton Cemetery (A. Gilbert)